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Jesse H. Neal Resigns as General Manager

American Paper & Pulp Association Discontinues Post and Appoints Charles W. Boyce Secretary, Placing Him In Charge of Headquarters and Activities of Association—Mr. Boyce, Who Has Been Connected With Association for Some Time Past, Is Familiar With Every Phase of Work, and Is Assured of Unqualified Cooperation

Charles W. Boyce, who for some time past, has been acting as assistant to the general manager of the American Paper and Pulp Association, has been appointed executive secretary of the association, and in future will be in general change of the headquarters' office, and of the activities of the association. Mr. Boyce is thoroughly familiar with every phase of the work and is assured of the unstinted cooperation of the industry.

Jesse H. Neal has resigned as general manager of the association and that post has been discontinued. The formal announcement from S. L. Willson, president of the association, follows:

Mr. Willson's Statement

"It is with considerable regret that I announce the resignation of Jesse H. Neal as general manager of the American Paper and Pulp Association. Although handicapped by most unfavorable business conditions beginning shortly after his appointment in 1929, Mr. Neal succeeded in putting into effect a good part of the recommendations made by our committee on reorganization.

"He established an equitable plan of financing the association, and formed the National Paper Council to promote cooperation between the component divisions of the industry. During Mr. Neal's administration the regular activities of the association have been expanded and improved wherever possible, and new services have been created. It is unfortunate, therefore, that conditions necessitate the discontinuance of the office of general manager. Mr. Neal takes with him the best wishes of the officers and members of the executive committee.

"At the same time, I desire to announce the appointment of Charles W. Boyce as secretary of the association, who will be in general charge of the headquarters' office and of the association's activities. Mr. Boyce is already well known to the members through his notable work as the head of our Pulpwood Department. He came with the association in 1928 following a creditable career with the Forest Service of the United States Department of Agriculture, to take charge of our former Woodlands Section. More recently he has been acting as assistant to the general manager and is thoroughly familiar with every phase of our work.

Cooperation Requested

"I bespeak for Mr. Boyce unstinted cooperation by all the mills that recognize the necessity of maintaining a strong national paper and pulp association, especially under the present conditions."

Takes Title to Saranac Pulp Co.

[FROM OUR REGULAR CORRESPONDENT]

PLATTSBURG, N. Y., March 14, 1932.—The Norstrand division of the Berst, Forester & Dixfield Company filed a deed this week with the county clerk in which it assumes title of the mills of the Saranac Pulp and Paper Company, of this place. The mills were disposed of at a public auction several days ago at which the new owners made an acceptable bid of $424,000. Prior to the sale the mills had not been in operation.

Officials of the Norstrand plant stated this week that two machines had already been placed in operation at the mills of the Saranac Pulp and Paper Company and a large number of the old employees have returned to work. The remainder will be recalled as the plant swings into near capacity production. Plans call for full time schedules with a greatly enlarged force in the near future. Production is also to be increased considerably. Resumption of activities was welcomed by the business men of the village inasmuch as the plant is one of the leading industries.

TAPPI Lake States Section Meets

The Lake States Section of the Technical Association of the Pulp and Paper Industry met at Menasha, Wis., on March 8th, the following papers being presented: "The Application of Anti-Friction Bearings to the Pulp and Paper Industry," by G. W. Curtis, district manager of the Timken Roller Bearing Company, Milwaukee, Wisconsin, and "Recent Trends in Pulp Bleaching," by R. S. Hatch, vice president of the Pulp Bleaching Corporation, New York.

Price Bros. & Co. Su Newsprint Institute

Action for $787,165 and Accumulated Interest of $36,695, Based on Alleged Agreement Whereby Various Members of Canadian Organization Were to Pay Certain Sums, Based on Current Sales—Taking of Evidence Completed and Case Adjourned

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 14, 1932.—An action involving three quarters of a million dollars, entered February, 1931, by Price Bros. & Co., Ltd., against a score of leading news print manufacturers comprising the Newsprint Institute of Canada, was heard in the Superior Court at Quebec during the week. The taking of evidence was completed and the case adjourned until March 22, when both plaintiff and defence counsel will present their oral pleas.

The action, which is for $787,165 and accumulated interest of $36,695, is based on an alleged agreement entered into between the members of the Institute at the time of its formation in November, 1928, when the industry was faced with a serious crisis, and by which various members of the organization were to pay into it certain sums, based on current sales.

The claimants allege that the defendant members neglected to carry out their end of the arrangement and are suing for the above-mentioned sums as owed them by the Institute.

C. R. Whitehead, of the Canada Power and Paper Corporation, and first president of the Newsprint Institute, was the first witness called. He outlined the conditions existing in the news print industry in the latter part of 1928 which prompted the formation of the Institute. It was not so much over-production, but over-capacity which hampered the industry he said, adding that paper was not produced for storage, the output being guided on the basis of current orders. The creation of the Institute, Mr. Whitehead went on, was for the purpose of stabilizing the industry and with a view to putting an end to unfair competition. The arrangement reached by the Institute, which had its office in Montreal, and to which monthly reports were to be made, was that certain of its member companies were to make specified payments while other members would receive varying compensations.

J. T. O'Reilly, secretary of the Institute, was examined as to transactions with Price Brothers, and said the agreement was that an average was to be struck on the basis of price per ton received by companies f.o.b. from their mills and that companies receiving more than the average were debited and those receiving less were credited. At the time the original agreement was entered into, freight differences were only allowed to companies situated in the Saguenay district, the latter being given an allowance of $1 per ton and Ste. Anne Pulp and Paper Company, 50 cents per ton.

During the proceedings the plaintiffs withdrew their case against the James McLaren Company, Ltd., of Buckingham, Que., after it was shown that the firm was not a party to the pool agreement entered into by the various members of the Institute. This came about when Ernest Rossiter, Montreal, president of the St. Lawrence Sales Corporation testified that the latter firm had made returns of sales of the McLaren company, without however, having any authorization from the latter company, adding that the McLaren Company was in no way bound to make returns to the Institute.

When the defence took up its case, A. C. Price, a director of Price Brothers, was called to the stand today and gave details of news print contracts entered into by his firm during the period from 1928 to the end of last year. He mentioned news print contracts signed by his company to do business with the *Cleveland News*, the *Philadelphia Evening Bulletin*, the *Washington Star* and the *Syracuse Herald*. Witness said that Price Brothers Sales Corporation handled the sales for Price Bros. & Co., Ltd., but did not handle the transactions of the Donnacona Pulp and Paper Company, which were in the hands of a New York agency. Mr. Price said that all the contracts mentioned by him were operated under the pool price agreement.

Presentation of reports and statements made by the various news print concerns to the Newsprint Institute of Canada followed. During the hearing it was testified that the Anglo-Canadian Pulp and Paper Company of Quebec had received $300,000 from the Newsprint Institute as its alloted share accruing from pooling of output.

W. H. O'Reilly, secretary of the institute, was recalled by the defence counsel and questioned as to the varying sums alleged to be due the Abitibi Pulp and Paper Company and the Backus group. The reports turned in by the Backus group, in regard to the number of tons sold, witness said, were given zone rate calculations. When the question of the payment of $300,000 to the Anglo company came up, Mr. O'Reilly told the court that Price Brothers had contributed $28,000 of this sum.

C. E. Backus, head of the four mills known as the "Backus group" which comprises Fort Francis, Minnesota & Ontario, Great Lakes and the Kenora Company, testified at the afternoon sitting that he was not satisfied with the ratings given his mills by the institute, and that it was for this reason that they withdrew from the organization. According to Mr. Backus, the total producing capacity of his mills per day was 1,142 tons, but he claimed that they were only rated by the institute at 1,061 tons; and that as a result there was a tonnage of 42,500 due him by the institute. The witness stated further that no action had ever been taken to re-adjust the ratings. "There was a lot of talk, but nothing done," he said.

Prior to the adjournment, statements and reports were submitted on behalf of the defence and witnesses and auditors examined in regard to them. A. C. Price was further recalled to testify that the contracts of the Donnacona Pulp and Paper Company were signed previous to the formation of the Newsprint Institute.

Canadian Branch for U. S. Wallpaper Co.

Winfield A. Huppuch, of Washington County, New York, former chairman of the Democratic State Committee for the State of New York, has been in Montreal during the past week in connection with the proposal to establish a Canadian branch of the wall paper manufacturing concern with which he is connected. The Canadian tariff has made it impossible for the United States to

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ALPHA FIBRE

The best papers can only be made from the best raw materials.

Our Technical Service Department is ready to coöperate with paper manufacturers desirous of developing high quality and great value in their papers.

BROWN Company FOUNDED 1852 Portland, Maine

BOSTON NEW YORK
CHICAGO ST. LOUIS
SAN FRANCISCO
BROWN CORPORATION, MONTREAL, CANADA

Pennsylvania Paper Mills Continue Active

Leading Paper Board Plants Return to Full Time Operation—Fine Paper Manufacturers Reported on Increased Schedule—Writing Paper Plants Speed Production—Book and Cover Paper Mills Also Expand Tonnages

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 14, 1932.—Though there was a slight reaction from the activity of the preceding week the manufacturing division of the trade appeared to have lined up with the improvement that was experienced in the latter part of February. Mills in the local territory were reported on increased time, board and fine paper manufacturers being the leaders in the improvement. Roofing manufacturers, however, are not maintaining production accordingly but remain among the laggards, one of the leading roofing mills in this vicinity having remained closed the entire week.

The most encouraging factor of the manufacturing situation is the ability of the leading paper board mills in this section to return to full time operation, with orders on hand to hold present business schedules for the remainder of the month. Fancy writing paper manufacturers are increasing production as paper distributors are preparing for the coming Spring seasonal demand. Those mills making book and cover papers are also increasing tonnage. Wrapping paper and specialties are in broader demand. Waxed papers and parchments are also more active.

Paper Trade Association Meets

Preparatory to the launching of a drive to add to its membership, the Philadelphia Paper Trade Association held a general meeting of fine and wrapping divisions at the DuFour Restaurant last Wednesday, and had as guests three of the leading fine paper merchants of the local industry, viz., Thomas Hare, of the Atlantic Paper Company; Frederic S. Balch, Schuylkill Paper Company; and R. Peale Bentley, Bentley Paper Company.

President William A. Hentz presided, and expressed his desire that the group become more firmly united in efforts for the stabilization of the paper industry, and with this end in view will co-operate with the members in promoting the membership drive to enroll additional firms in the organization. There was a round table discussion of business. The concensus of opinion was that in February, while experiencing customary quietness in the early days of the month, trading improved in the end, and this continued into the first days of March, with steady rising demand for wrapping paper and spotty demand for fine paper.

An especially pleasing report was the satisfactory functioning of the Credit Interchange Bureau, which was organized a short time ago. This feature of trade organization was lauded as a most beneficial factor for protection and maintenance of business. There will be resumed the bimonthly meetings of the Paper Trade Association, as in former years, with alternating fine and wrapping paper sessions, and the credit interchange work will be prominently linked with the coming program of the organization.

Paper Jobbers to Confer With Distributors

Following discussions and motion introduces by Charles Resnick, of L. Resnick & Sons, for conference of paper jobbers with distributors regarding the sale of small lots of paper to consumers, the Philadelphia Paper Jobbers Association has appointed a committee to wait upon the distributors on this matter of trade practice. President Nathan D. Isen appointed the following to the committee: Frank Dubin, Dubin Paper Company; B. Magid, Magid Paper House; Julius T. Witte, Witte Paper Warehouse; and S. S. Goldman, Fairmount Jobbing House. Mr. Resnick asked the manufacturers and their agents, in his motion, to arrange a meeting with the jobbers to take up the matter of sales of small orders to the consumer with a view to correction of practices that were making inroads on the jobbers business and to provide for future policies of mutual satisfaction to distributors or manufacturers agents, and to the smaller paper dealers classified as jobbers. This is particularly true of the bag situation, where sales of bags in small lots have been made directly to consumers, and where the jobber has been confronted with hardships to meet competition and still conduct a profitable business. The newly appointed committee will take up the question with the distributors or manufacturers' agents at an early date.

Moore & White Modernizing Scott Paper Units

The Moore & White Company, 15th street and Lehigh Avenue, are engaged in modernizing and overhauling the presses and drivers of the Scott Paper Company, of Chester, Pa. The local machinery manufacturers are replacing the old presses with suction presses and renovating the drivers with modern units.

Green Band Dealers Meet

Local dealers in Green Band butchers fibers, made by the Continental Paper and Bag Corporation, assembled at the Penn Athletic Club last Wednesday, enjoyed a buffet luncheon, and discussed market conditions for that particular product, and the general situation for fibers of this character. There were eight dealers in Green Band fibers present, including the Huff Paper Company; Galen Paper Company; Dubin Paper Company; Wilson Paper Company; B. Kessler; Donalson Paper Company, Harrisburg, Pa.; and the Whitaker Paper Company, of Baltimore. J. H. Wantling, Philadelphia representative of the Continental Paper and Bag Corporation, with offices in the Land Title Building, presided on behalf of the manufacturers and extended hospitality to the group of dealers.

Huff Paper Co. Adds Two Salesmen

Having materially expanded its cellophane and bag division, the Huff Paper Company, Delaware Avenue and Spring Garden street, has added two additional salesmen to its staff to cover the cellophane and bag trade, concentrating on these specialties.

L. Resnick & Sons Change Quarters

With its business expansion, L. Resnick and Sons, formerly at 231 South 2nd street, has taken larger quarters in the five story building at 131 Dock street, in

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DOWNINGTOWN

REAR END SUCTION

PHOTO shows Downingtown Suction Rolls at First and Second Press. These rolls are arranged with direct drive and rear end suction, while all adjustments to deckles, packing strips and suction box are made from the front side, while running. Rear End Suction simplifies vacuum piping, making it possible to run direct from roll to pump, without passing under machine to front side. It also makes it unnecessary to break any joints in vacuum piping when putting on clothing ▲ ▲ ▲ The Downingtown Mfg. Co., Downingtown, Pa.

Boston Paper Market Slightly More Active

Fine Paper Merchants Busier Than for Some Time Past—Demand for Wrapping Paper Slackens, Although Industry Continues Generally Optimistic—Some Improvement Noticed in Box Board Division—Quotations Generally Unchanged

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 14, 1932—With a slight improvement in conditions and the industrial outlook as a whole, the paper industry is a shade better, according to estimates, with encouragement developing to a certain extent. Some merchants say they are getting their share of what business there is, but it is intimated that, at best, the volume of orders is hardly more than fair. In fine paper a pronounced improvement in inquiries is noted in some quarters. One of the trade, in referring to the inquiry for paper for advertising purposes, intimated that he had not seen such a favorable condition for some time. Some of the fine paper trade are busier than for a considerable period. There is a moderate volume of inquiry for wrapping paper, some of which is developing into orders. In some quarters, the demand has slackened, but the trade is feeling generally optimistic.

There is a slight betterment in the box board market. One of the chief demands of late has been for material for shoe boxes, particularly for the Easter trade.

Paper Stock Quiet

Paper stock has been somewhat quiet, although there has been a little improvement and a certain amount of inquiry for folded news, kraft paper, corrugated boxes and screening wrappers. The average price of kraft No. 1 is .80, with a range of .75 @ .85. Old newspapers have been marked up to .25 @ .30, from a former price of .22½ @ .27½. Corrugated boxes remain at .22½ @ .27½ and screening wrappers at .25 @ .32½. There is a general tendency to ask higher prices for the lower grades. Prices of mixed papers and news have been too low to be profitable. The trade here is watching the progress of the strike of collectors of waste paper in New York who object to accepting the prevailing low prices. Business in other lines seems to be a trifle better. There are more inquiries in a market which is in a satistically favorable condition, being practically bare of stocks. With any definite improvement in business, prices would rise rapidly, owing to a scarcity of most grades, according to opinion expressed in the trade.

W. Murray Crane Held Up

An Associated Press despatch from Dalton, Mass., states that W. Murray Crane, widely known as a paper manufacturer, was robbed at pistol point at his home in that place at three o'clock in the morning of March 5, by a man who took $50 and a ring. The telephone wires had been cut. The burglar broke into the house and forced Mr. Crane to go downstairs, requiring him to turn over the money and the ring while he covered him with a revolver. Mr. Crane is a son of the late former United States Senator W. Murray Crane.

News of the Trade

A meeting will be held at the office of the Andrews Paper Company, March 18, with Frank Scheller, vice president of the Gilbert Paper Company, in connection with the lines of that company. Roger Fuller, Eastern representative of the Gilbert Paper Company, will be present. The Andrews Paper Company is stocking twelve of the principal lines of this company in its Boston warehouse. The Andrews Paper Company sent a folder containing samples of six colors of Sandow Bond, a sulphite product, to the trade last week. This paper is priced with the trend of the times. The company is stocking the paper in seven sizes in substance 16 and 20. The cover of the folder is a sample of Riegel's Leatheret.

A meeting of the sales force of Stimpson & Co., Inc., was held March 12, at which Edson S. Dunbar, advertising manager of the Crocker-McElwain Company, gave a general talk on paper made by that company and the Chemical Paper Manufacturing Company.

John Carter & Co., Inc., are putting out new sample books of Waterfalls Cover, manufactured by the Waterfalls Paper Company, in the Surftone, Spanish Leather and Handmade Finish Lines.

A regular sales meeting of the Storrs & Bement Company was held recently at which William N. Stetson, Jr., president, and John H. Brewer, general manager presided. The Storrs & Bement Company has just become agent for a new line, Metal Art Cover, made by the Marvellum Company in one weight and two sizes, and six luxurious colors.

Since the reduction in price of Silvertone envelopes there has been more active interest in this line, which is handled by Knight, Allen & Clark.

Boston distributors for the Geo. W. Wheelwright Paper Company are issuing the new prices on B. P. F.

John L. Munro, of Munro & Church, who has been ill for the last four weeks, is improving and planning to sail for Bermuda, March 18, accompanied by Mrs. Munro and their daughter, Virginia.

Reports from Max Frank, for nearly fifty years a buyer for John Carter & Co., Inc., are that he is making a slow recovery at his residence from a recent operation.

C. S. Garrett & Son To Continue

Following the receivership appointed to adjust the financial conditions of C. S. Garrett & Son Corporation, one of the oldest of roofing paper and builders supplies concerns in the Quaker City trade, with headquarters at 20 South Marshall street, there was announced last week plans to continue the business. An announcement sent to the trade stated that the business would be continued under the management of Robert A. Batchellor, former head of C. S. Garrett & Son Corporation, while the firm will in the future be known under its old title of C. S. Garrett & Son, the corporation having been dissolved with the return of the business to its original status. Mr. Batchellor was head of C. S. Garrett & Son Corporation more than a score of years and has been linked with the paper industry since 1879. Schedule filed in the U. S. District Court here in the bankruptcy proceedings gives liabilities of $40,306 and assets as $32,969. The firm will be conducted under the management of Mr. Batchellor pending reorganization. The same lines of roofing materials, paper builders supplies, and allied products, will be carried under the new arrangements.

$500 REWARD

will be paid to the person supplying me or the local police, with the first information leading to a successful prosecution of any person or firm manufacturing paper outside the Irish Free State, bearing the watermarked words

"PAPER GUARANTEED MADE IN IRELAND BY SWIFT BROOK PAPER MILLS LTD."

OR

"PAPER GUARANTEED MADE IN CO. DUBLIN BY SWIFT BROOK PAPER MILLS LTD."

Philip O'Reilly
Solicitor,
19 St. Andrew Street,
Dublin, I. F. S.

Demand for Paper Fairly Active In Chicago

Fine Paper Market Exhibits Stronger Undertone, With Prices Generally Steady—Some Improvement Registered in Sulphite Bond Division, Following Firmer Quotations—Book and Cover Papers Continue Practically Unchanged

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 12, 1932—Strengthened demand was noted in the Chicago paper market during the past week. Buying for spring trade improved, although very cold weather has not provided any stimulus. The markets continue fairly firm, with slight price advance in some coarse paper lines noted—particularly in dry finished butchers. Kraft and bag markets continue to hold a firmer tone.

The annual packaging exposition held in Chicago this week served to bring the container and folding box manufacturers into the limelight and some enthusiasm was expressed over the possibility of new uses lifting the paper board industry into better times. The use of color and the adaptability of the new products shown at the Palmer House served as a sales stimulus and buyers were reported as much interested.

The fine paper market held its position, prices remaining steady, and the sulphite bond market continuing to exhibit a stronger position following the price raise of a short time ago. Book and cover papers remain practically unchanged, with a few manufacturers representatives here announcing slight price reductions in certain grades. News print markets have found no stimulus in the newspaper field but lineage is expected to increase sharply when business confidence has fully returned. Ground woods are reported dull. Little activity has been reported in the waste market, though a few minor price changes are reported.

Packaging Exposition Successful

I. C. Keller, manager of the folding carton division of the Container Corporation of America provided a good bit of the enthusiasm at the second annual packaging exposition held this week at the Palmer House, Chicago, when he reported an atmosphere of enthusiasm that bordered on optimism among the exhibitors and attendants. "The wide range of containers shown is notable for the amount of color used," said Mr. Keller. "The influence of modern art has simplified much package design, increasing display and selling value."

The paper industry was unusually well identified at the exhibition and conference, many of the exhibitors hailing from the paper industry and a large group of executives from the paper box group were present at the various sessions. J. H. Macleod, vice president of the Hinde & Dauch Paper Company; H. H. Jones, sales manager of the Waxed Paper Division of Kalamazoo Vegetable Parchment; E. E. Ames, vice president of the General Box Company, and Leonard J. Doyle, western sales manager of the Union Bag and Paper Corporation, took active part in the Saturday, March 12, meetings devoted to a clinic and exposition on "The Essentials of Profitable Packaging." Included in the personnel of the advisory committee for the Second Packaging Conference and Exposition were M. S. Flint and Warren B. Moore of the Brown Company; H. W. Tunstall and J. J. Hood of A. M. Collins Manufacturing Company; C. W. Stephens, Dominion Paper Box Company; J. D. Malcolmson, Robert Gair Company; R. W. Whitney, Hinde & Dauch Paper Company; H. H. Jones, Kalamazoo Vegetable Parchment Company; O. T. Thompson, Kimberly-Clark Corporation; Donald V. Lowe, Lowe Paper Company; H. S. Daniels and L. J. Doyle, Union Bag and Paper Company; Paul S. Hanway, American Waxed Paper Association; L. I. Houghton, Glazed and Fancy Paper Manufacturers Association; O. M. Porter, Kraft Institute; Raymond Bell, Liquid Tight Paper Container Corporation; H. P. Beckett, National Paper Box Manufacturers Association; Hugh Peat, Pacific Coast Paper Box Manufacturers Association, and G. R. Browder, of the Paperboard Industries Association.

The Packaging Exposition was held in the Exposition Room of the Palmer House. The exposition reflected current accomplishment with respect to packaging, packing and shipping materials, mechanical equipment, supplies, etc. It was a complete cross section of packaging and packing endeavor and should have been of material assistance in aiding buyers and users in solving packing, packaging and shipping problems. Included in the list of exhibitors were Artcote Papers, Inc., the Container Corporation; The Container Company; Hinde & Dauch Paper Company; International Paper Company; Kalamazoo Vegetable Parchment Company; Kimberly-Clark Corporation; Morris Paper Mills; Pioneer Paper Stock Company; Riegel Paper Corporation and the Union Bag and Paper Corporation. There were more than 100 exhibitors and it is estimated that nearly 10,000 buyers and users visited the exposition and attended the clinics.

Chicago Paper Association Meets

The Chicago Paper Association held its regular meeting last Tuesday evening, March 8, at the Bismarck Hotel. While no particular business was accomplished, the meeting served to straighten out the situation in dry finished butchers, which has been puzzling, since the recent advancement in price. A round table discussion enabled the members handling this product to come to some common basis of opinion as to the re-sale price of the product. Reports from the meeting itself indicate that the coarse paper market continues firm in the Chicago area. Bags, kraft papers, dry finished butchers, etc., were all mentioned as maintaining their improved position. The association has not as yet set a date for the April meeting at which a number of visitors—including fifteen non-members—will be invited in to hear the story of the association work and to give consideration to joining the association.

Paper Stock Porter Routs Bandits

The Roosevelt Paper Stock Company, 1017 South Fairfield Avenue, Chicago, had a bit of excitement last Saturdry, March 5, when four bandits entered the plant, lined up the manager, Harold Aaronson, a clerk, and a colored porter, and forced the surrender of $100. As the men left, the clerk, Rappaport, seized a pistol and followed the bandits to the street. The bandits turned on him hitting him in the right arm. The porter seized the pistol and fired five shots and it is believed fatally wounded one of the bandits.

from BROKE to chest in five minutes

Voith Pulper

One of the outstanding economies effected in progressive mills in the paper making industry is the *immediate* conversion of broke and trimmings and the returning of the repulped stock to the system *while the order is still running.* Voith Pulpers make this possible and thereby are saving thousands of dollars annually.

Let Voith engineers furnish you with complete data and estimate how the immediate repulping of broke will quickly pay for this pulper.

Reconditions

Dry Pulp, Machine Broke, Trimmings, and all Grades of Paper and Board

J. M. VOITH Company, Inc.

Chrysler Building

405 Lexington Avenue **New York City, N. Y.**

New York Trade Jottings

Westbrook Steel, secretary of the Institute of Paper Chemistry, Appleton, Wis., is a New York visitor this week.

* * *

Zenith Paper Corporation, of Brooklyn, N. Y., has been chartered under the laws of the State of New York, with a capital stock of 100 shares common. E. Zorn, of 33 West 42nd street, is the attorney.

* * *

A. E. Cadman, secretary of the Canadian Pulp and Paper Association, and Mrs. Cadman, passed through New York last Saturday, en route for Montreal, after spending an enjoyable vacation in Bermuda.

* * *

R. S. Kellogg, secretary of the News Print Service Bureau, with headquarters at 342 Madison Avenue, New York, gave a talk before the Conference of Statisticians In Industry, on Tuesday, March 15, on "Some Long-Time Factors Affecting News Print Paper Consumption."

* * *

Milton Paper Company, Inc., of 119-125 West 24th street, New York, has leased an additional 10,000 square feet of space, bringing the total to 50,000 square feet, exclusive of warehouse facilities. The additional space will be used partly for new lines of merchandise, as well as to permit the erection of more steel shelving for open stock.

* * *

Union Bag and Paper Corporation, with main offices in the Woolworth Building, New York, has adopted a group insurance program which will include more than one thousand employees in its various sales offices and plants throughout the country. The contract is being underwritten by the Metropolitan Life Insurance Company.

* * *

Hermann Frischer Chemisch-Technisches Buro, of Berlin, Germany, has, after twenty years of successful operation all over Europe, established a branch office in this country, under the name of H. H. Frischer & Co., 24 Monroe Place, Brooklyn, N. Y., as consulting engineers for the heavy chemical industry. Dr. K. F. Sonnenstuhl is the resident manager of this office.

* * *

There was an excellent attendance at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, held last Tuesday at George's Restaurant, New York. Richard S. Conway, vice-president of Associated Consulting Economists, who was the guest speaker, gave an interesting and informative talk on the probable effect of the proposed Sales Tax on the paper industry and general business. His address was greatly appreciated and was followed by a spirited discussion, in which most of the salesmen and association officials present took part.

* * *

Texas Gulf Sulphur Company, with main offices at 75 East 45th street, New York, reported a net income of $8,942,602 for the year ended December 31, 1931, after charges and Federal taxes, but before depletion. This was equal to $3.52 a share on 2,540,000 shares of no-par capital stock and compared with a net of $13,972,085, or $5.50 a share, in 1930. For the quarter ended December 31, net income was $2,238,511, or 88 cents, a share on the capital stock, as against $2,315,926, or 91 cents, a share in the preceding quarter, and with $3,178,286, or $1.25 a share in the fourth quarter of 1930. Current assets as of December 31, 1931, were $19,548,500, compared with $19,447,550 at December 31, 1930, and current liabilities were $1,532,207, against $1,214,198, leaving indicated net working capital of $18,016,293, against $18,233,352, at December 31, 1930. Surplus, including reserves for depletion was $25,888,247 at December 31, 1931, compared with $25,200,645 at the end of December of the preceding year.

PENNSYLVANIA MILLS ACTIVE

(Continued from page 18)

the heart of the produce business, running along the Delaware River section. The building has been modernized and equipped with up-to-date display fixtures to exhibit the full line of products handled by the firm in specialties for the food supply trades. There has been erected on the main floor a 45 ft. wall case standing 15 ft. high, in which are exhibited such paper products as food containers, baskets, food wrappers, packing containers, twines, bags, fancy food and fruit packing boxes, wraps and allied lines in specialties. The firm, which has been engaged in the paper business for the past seven years, is one of the largest specialists in paper products catering to the wholesale and retail food trades and produce merchants. The members of the firm are Charles Resnick and his brother, Joseph Resnick, the former an organizer of the new Philadelphia Paper Jobbers Association, and its treasurer.

Miriam Claire Weds

Miriam Claire, secretary of the Progressive Paper Company, 134 North Delaware avenue, dealers in wrapping paper and specialties, is on a two weeks' honeymoon following her marriage last Sunday to Dr. Morton Seidenfeld, a physician, of San Francisco, Cal. The wedding took place at Temple Beth Israel, the bride's mother, Mrs. Minnie Claire, Seattle, Wash.; her brothers and associates in the business, Harry and Samuel Claire; and a large assembly of friends and associates attending. Following a honeymoon trip the newlyweds will return to Philadelphia and Mrs. Seidenfeld will resume her association with the business.

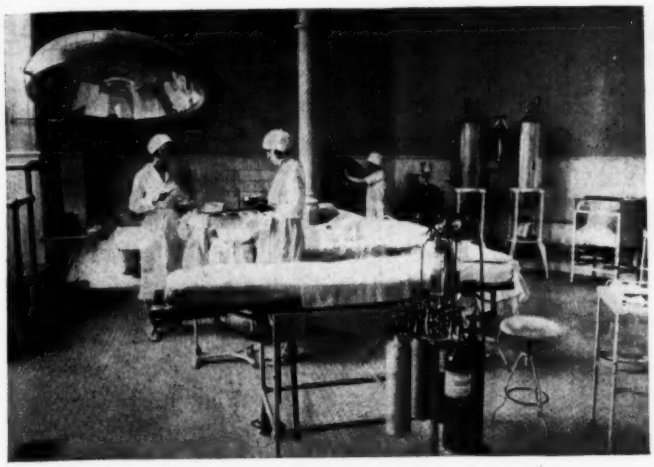
Samuel Kardon Sails for Europe

Samuel Kardon, of the American Bag and Paper Company, Delaware avenue and Bainbridge street, sailed last week for Europe on an extended tour of the Mediterranean. He was accompanied by his daughter, Miss Dorothy Kardon. During his absence the business will be conducted by his son, Emanuel Kardon, who is associated with him in the business.

Swedish Pulp Received at Albany

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., March 14, 1932.—A record for winter shipping was established at the local port terminal during the past week with the arrival of an ocean steamer with a cargo of sulphite pulp for paper mills in Northern New York. Its coming was unexpected as no vessels had been anticipated before early spring. Open water conditions in the Hudson River this winter have smashed all previous records and shipping activities could have been carried on without any interruption. The cargo of pulpwood received at the local terminal was from Sweden and is understood to be destined for the mills of the Union Bag and Paper Corporation at Hudson Falls.



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A STABILIZED FORESTRY POLICY

A strong plea for a land utilization program that will insure stability of use for the nation's acres in forests was made by Major R. Y. Stuart, chief of the Forest Service, United States Department of Agriculture, before the Land Utilization Conference held recently at Chicago.

"Stable use is reasonably assured for most of the approximately 100 million acres of forest land that is now owned by the public," Major Stuart said. "The national forests and national parks are not likely ever to be turned over to other forms of use, if public sentiment continues vigilant to safeguard them against schemes or measures endangering their integrity. The same can be said of the state forests and parks in those few states which have definitely and permanently dedicated them to forest use by constitutional or legislative enactment."

In very few states, however, Major Stuart pointed out, is there a definite policy on the use of land that reverts to the State or counties as a result of tax delinquency. "Most of them," he explained, "endeavor to return the land to private ownership, without regard to its economic possibilities, and without any assurance that the process will not be repeated after a few years.....One of the first steps that should be taken is to formulate definite policies for stabilizing the ownership and values of unreserved forest land now owned by counties, states, and Federal Government, and of that which is returning to public ownership. Such land should not be alienated unless it can be depended on to remain in private ownership and to be utilized in a way that will not conflict with the public interest."

The bearing of forest policy on the future of American agriculture is apparent, Major Stuart declared, when it is realized that forests occupy nearly half of the land that is potentially available for future expansion of the crop area. At present the forest area, comprising one-fourth of the land area of the United States, is larger than the combined area in crops and improved pasture. One-seventh of all the land in farms, and east of the Mississippi River more than one-fourth, is woodland.

The major objective of a forest policy, Major Stuart said, "is to keep existing forest land in such a productive condition that it will furnish needed supplies of timber, conserve water, check erosion of the soil, and conserve recreation values and wild life, and to keep the land from being diverted to other uneconomic uses which would threaten the welfare of existing agriculture."

"Forest cover can be destroyed and the land utilized for crops or pasture on very short notice," he continued, "but once the cover has been destroyed, it is not so simple a matter to return the land to forest use, either for timber production or even for protective cover. For this reason, stability of policy is essential if the land is to be used for forestry..... Stability of policy requires either a fairly strict public control over the use of the land or a considerable degree of stability of ownership.

"The ownership, and consequently the policy of utilization of much of the privately owned forest land, and of some of the publicly owned, is essentially unstable. East of the Great Plains approximately 95 per cent of the forest land is in private ownership, and in the West, about 25 per cent..... A large area, roughly one-third of all the privately owned forest land of the country, belongs to farmers."

Land on which forestry can be made to pay, and which is now privately owned, should remain in private ownership, Major Stuart maintained, unless there are special reasons for its acquisition by the public. For farm woodlands and other small holdings, in his opinion, it may be possible to reduce costs and increase returns through the development of cooperative management and marketing.

"Any attempt at this time to estimate the area of forest land that should be acquired by the public would be futile," Major Stuart asserted. "All that can be said is that the area is very large—much larger than has been contemplated in any program hitherto proposed..... In general, the Federal Government should acquire mostly those lands which either can be managed best in connection with existing national forests, or which have an influence upon the flow or the silting of interstate or navigable streams. Acquisition of other lands should be left mainly to the states, counties and municipalities."

SULPHATE PRODUCTION DECREASES

Production of sulphate pulp in leading European producing countries, with the exception of Finland, and in Canada has shown a steady decrease during the past three years, according to preliminary figures for 1931 now made public.

Production in Sweden, which ranks second only to the

United States in volume of production, dropped from 716,300 short tons in 1929 to 696,700 tons in 1930 and to 668,800 tons in 1931.

The output in Norway during the same years is reported at 77,300 tons, 23,700 tons, and 8,000 tons respectively.

Germany also decreased its production from 51,300 tons in 1929 to 35,700 tons in the succeeding year, with a further drop to 31,300 tons in 1931.

Production in Finland, however, during this period increased from 156,900 tons in 1929 to 192,100 tons in 1930 and to 209,800 tons, in 1931, according to preliminary statistics. Neither Canadian nor United States figures are available at present for 1931. The former, however, reduced its output from 250,100 tons in 1929 to 188,300 tons in 1930, while the latter increased its output from 922,700 tons to 952,300 tons in the same period.

Bibliography of Bibliographies on Chemistry

The National Research Council announces the publication of Bulletin 86, which is the Second Supplement to the Bibliography of Bibliographies on Chemistry and Chemical Technology covering the period 1929-1931. The original Bulletin (No. 50) covered the period 1900-1924 and contained about 10,000 bibliographies classified under 2400 headings. The First Supplement (No. 71) covered the period 1924-1928 and contained about 4000 bibliographies under 1050 headings. The Second Supplement (No. 86) covers the period 1929-1931 and contains approximately 3300 bibliographies under 950 headings.

As the title indicates, the work (as in the case of Bulletins No. 50 and 71) is a compilation of bibliographies published as separates, or at the end of books or magazine articles, or as footnotes to the same, on the numerous aspects of pure and applied chemistry. Each entry gives names of author or compiler, title, and place of publication. The majority of the entries state the number of references, thus giving an indication of the completeness of the particular bibliography. The entries are classified under the proper subject-headings, alphabetically arranged. The duplication of individual entries has been largely avoided by the liberal use of cross references.

As an example of the value of this compilation, the following information is given regarding the number of bibliographies reported in Bulletin No. 86 for some of the more important topics:

Biochemistry 32, Blood chemistry 75, Carbohydrates 29, Ceramics 18, Coal 16, Colloids 30, Cement and Concrete 35, Fats 33, Fertilizers 34, Foods and Feedingstuffs 49, Hormones 31, Iron and Steel 90, Metabolism 72, Milk 44, Paper 35, Petroleum 65, Plant chemistry 39, Rubber 35, Soils 76, Vitamins 41, Water 33.

These Bulletins may be obtained from the Publication Office, National Research Council, Washington, D. C., at the following prices: No. 50, $2.50; No. 71, $1.50; No. 86, $1.50. Special price on complete set ordered at one time, $4.00.

New Maihak Engine Indicator

Bacharach Industrial Instrument Company, of Pittsburgh, Pa., have just published a catalog covering recent developments in their line of Maihak Engine Indicators, specially built for use on Diesel engines. Copies may be obtained upon application.

Leather Belting Now Sold by Thickness

The American Leather Belting Association has decided that for the greater protection of the consumers of leather belting, it should establish and sell this commodity by specifications of thickness instead of weight, thereby discarding the old weight terminology of "ounces per square foot" which may be varied by the mere addition of weighting materials to the leather, and does not necessarily always represent a differential in transmission values. This decision was reached after the association had canvassed all manufacturers of belting throughout the country, with the result that 81 replies were received, all voting for the change. Therefore, the movement can be considered as having the endorsement of the entire industry.

This is an interesting and progressive move for the purpose of establishing higher standards for a product that has been sold by weight for many years. Inasmuch as leather belting prices are based on thickness, the simplicity and common sense of this change has met with the instant approval of both manufacturers and users of leather belting. It simplifies and makes comparatively easy the checking of each piece of belting to see if the average thickness is as ordered.

The thickness specifications now in effect for first quality leather belting are as follows:

Medium Single	10/64" to 12/64"
Heavy Single	12/64" to 14/64"
Light Double	15/64" to 17/64"
Medium Double	18/64" to 20/64"
Heavy Double	21/64" to 23/64"

1. All thicknesses in this table are average thicknesses in inches, and should be determined by measuring 20 coils and dividing this value by the number of coils measured. In rolls of belting containing less than 20 coils the average thickness should be determined by measuring one-half of the total number of coils and dividing this value by the number of coils measured.
2. The classification of "Light Single" has been eliminated entirely.
3. Uniformity: No point in either single or double belting shall be more than 2/64 in. thicker or more than 2/64 in. thinner than the average thickness.
4. The second and third quality brands of each manufacturer bear the same relative thickness to the manufacturer's first quality grades as they did in the past under the old ounces per square foot specification.

These thicknesses are now in effect and should be used by all buyers of belting in wording their orders. Every order for single or double should specify the thickness on the order. If just the words "Light," "Medium," or "Heavy" appear on the order these words now mean the thickness as per the above table and *not the weight as formerly.*

Awards for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 16, 1932—The R. P. Andrews Paper Company has been awarded the contract for furnishing the Government Printing Office with 456 pounds (6,000 sheets) of 10½ x 29 buff antique cover paper at 29c per pound, bids for which were received on February 29.

Philip Rudolph Son, Inc., will furnish 200 sheets of 26 x 38 pulp board at $3.25 per 25 sheets, bids for which were received on February 24.

The Kalamazoo Vegetable Parchment Company has been awarded the contract for furnishing the Government Printing Office with 1,000 pounds of oiled brown tympan paper in 48 inch rolls at 11.5 cents per pound, bids for which were received on February 10.

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Section of the
Technical Association of the Pulp and Paper Industry.
Edited by Ronald G. Macdonald, Secretary

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

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Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.

Raw Materials

Utilizing the Stem of *Asclepias Syrica*. N. N. Orlov. J. —Chem. Ind. (Moscow) 7:463-467 (1930); Chem. Abstr. 25: 5555.—The stems of *Asclepias* can be used as raw material for the manufacture of paper. 720 kg. *Asclepias syrica* containing 12.5 percent moisture was finely divided and charged into a boiler with 420 kg. sodium sulphite, 40 kg. sodium carbonate and 1590 liters water and heated 16 hrs. at 5.5 to 6 atmospheres. After washing, the yield of dry material was 53.8 percent. The material was treated with a 3 percent solution of hydrochloric acid for 15 hrs., then washed 2.5 hrs. and bleached with hypochlorite for 5 hrs. at 30 deg. C. The yield of dry and bleached material was 43.2 percent; it was filled with 13 percent kaolin, 3 percent glue and 4.5 percent alumina. 20 percent sodium sulphite and 3 percent sodium carbonate, heated 4 hrs. at 170-80 deg. C. and 8 atmospheres, yielded 25 percent cellulose; the content of alpha-cellulose was 85 percent, ash 0.8 percent, products extracted with ether 1.4 percent, products extracted with alcohol and ether 1.6 percent.—C. J. W.

Bamboo, the Paper Fibre of the Future. Carl G. Schwalbe. Proc. World Eng. Congr., Tokyo, 31:497-500 (1929).—General discussion.—C. J. W.

Chemical Investigations of Bamboo. IV. Study of Bamboo Cellulose. Sutezo Oguri and Masa-aki Nara. U. S. Soc. Chem. Ind. (Japan) 34 (Supp. Binding), 328B-329B (Sept., 1931).—Cellulose prepared from ground Japanese bamboo (Phyllostachys pubescens, H. Leh.) by a modified Gross and Bevan method was subjected to the Lieser viscose test and the results compared with those given by tissue paper (prepared from cotton) and those obtained by Lieser with cotton. It was found that the amount of viscose produced was greatest with bamboo and least with cotton, showing that bamboo cellulose has the greatest and cotton the least chemical affinity for alkali.—A.P.-C.

Paper Making Fiber from Material Such as Sugar-Cane Bagasse. Hachiro Kumagawa and Kamakichi. U. S. pat. 1, 818,897 Aug. 11, 1931.—The raw material is beaten to render the fibers readily separable, and is subjected to the action of a body of water flowing in one direction to remove sugar and other water-soluble substances and cause the heavy insoluble material to be precipitated, and the long and thin fibers to be suspended in the water and the short and pithy fibers to float on the surface of the water, when the different kinds of fiber are separately removed and recovered.—A.P.-C.

Deinking Old Papers. W. Jay Russell. Paper Mill 54, No. 45: 14, 20 (Nov. 7, 1931).—A discussion of the merits and performance of the snow-white deinking process, which simply uses an agitator or pulping engine to create a brushing action of the stock against itself, which when treated with "snow-white chemicals" (composition not disclosed) completely defibers, disintegrates and hydrates the paper converting it back into pulp and when run through the refiner is ready for the screens and washers.—A.P.-C.

Rational Treatment of Paper Making Rags. D.C.M.I.P. Papeterie 53: 1133-1141 (Sept. 25, 1931).—A brief outline of modern practice in the conversion of rags into halfstuff.—A.P.-C.

Mechanical Process

Wet Preserving and Deterioration of Ground Wood. A. St. Klein. Zellstoff Papier 11, No. 8: 467-468 (August, 1931).—A short review of the available literature on the subject is given. The preservation of ground wood in water is far superior to the storing it in contact with the atmosphere. A bleaching with bisulphite solution can be carried out while the ground wood is stored under water. Brown ground wood is more stable than the white, and it is recommended to mix the two while under storage. Investigation over the fungus growth is reported, as well as the chemical change caused by microorganisms on the ground wood. The yield from wood which has been attacked by fungus can be determined by treatment with a 1 per cent solution of sodium hydroxide.—J. F. O.

Feeding Device for Wood Grinders. Eino Lauila, Tuokslahti, Finland. Fin. pat. 13162 (Jan. 29, 1929).—It consists of an endless belt provided with a suitable transportation means, which passes around the stone at a certain distance therefrom and thus utilizes almost the entire surface of the stone for grinding purposes.—J. F. O.

TAPPI Section, Page 138

Grinder for the Fine Grinding of Ground Wood, Pulp or Similar Materials, with Several Bed Plate Stones Arranged Around the Periphery of the Grind Stone. Mex Tamaschke, Herzberg. Ger. pat. 520423 (Nov. 18, 1927).—The grind stone is surrounded for the greater part by bed plate stones which are adjustable in a radial direction. The space between the single bed plate stones is taken up by heating coils which are for the purpose of heating up the stock.—J. F. O.

Continuously Operating Wood Grinder. Otto Andresen, Vinderen, Norway, Ger. pat. 512607 (Feb. 3, 1927).—The feed drum is fastened to a lever which pendulates about an axis and at the other end is the motivating power. The wood is fed onto the stone from a bin which is located above the lever arm and is held to the stone by means of a special chain.—J. F. O.

Device for the Regulation of the Load on Wood Grinders. A. E. G. Union, Vienna. Czech. pat. 34413.—The regulation of the wood feed is directly dependent on the pressure of the wood on the grind stone.—J. F. O.

Temperature Measurements in a Natural Pulp Stone. F. Ruhlemann, Papier-Fabr. 29, No. 29:461-477 (July 19, 1931).—A very valuable contribution to the knowledge of natural pulp stones. After earlier experiments over the measurements of temperatures of artificial pulp stones, the author continues his experiments on natural pulp stones used in a pocket grinder. The thermo couples used are made of copper and constantine and because of excellent rubber insulation against mechanical injuries they are elastic and resistant to defects. Twelve measuring places in the stone gives an unobjectionable observation of the temperature variations. From more than a thousand single measurements, special characteristic experimental periods are shown by curves, taken when the load on the stone varies as well as when changes in the grinding takes place. Natural stones show a very good heat conductivity. The resistance caused by the rubbing of the bearings has no influence on the center of the shaft and the stone. The symmetrical breaking off of pieces of natural stones are caused by vibration resonance and not by the heat caused by friction.—J. F. O.

Continuous Grinders and Pocket Grinders. R. Schallock. Wochbl Papierfabr. 62, No. 29: 693-696; No. 30: 718 (July 18, 25, 1931).—Continuation of the polemic over continuous grinders and pocket grinders supported by J. M. Voith and K. Klimpke respectively. Mention of the method of treating the subject is here discussed.—J. F. O.

Process for Pulping Wood. John S. Busch. U. S. pat. 1,818,-039 (Aug. 11, 1931).—The material, in the form of chips, is fed downwardly between a pair of horizontal crushing rolls which are submerged for more than half of their diameter in a liquid such as caustic soda solution, and the crushing action of the rolls is repeated by flotation and inward movement of the chips toward the space between the rolls until the chips sink in the liquid.—A.P.-C.

Alkaline Processes

Making Pulp for Japanese Paper by Use of Chlorine. S. Ochi, I. Fujimoto and H. Murasugi, Proc. World Eng. Congr. 31: 515-521 (1931); Brit. Chem. Abstr. 1931B:1088.—Chlorination followed by alkaline treatment of a number of fibrous materials indigenous to Japan gives good yields of satisfactory pulps which may be used for the manufacture of papers having the usual Japanese characteristics. Coniferous woods are unsuitable.—C. J. W.

Recovery of Values from Spent Cooking Liquors from Pulp Manufacture. George A. Richter assignor to Brown Co. U. S. pat. 1,815,328 (July 21, 1931).—Spent cooking liquor containing sodium-sulphur compounds is smelted in an oxidizing atmosphere to produce a smelt containing sodium carbonate and sodium sulphate, an aqueous smelt solution is formed and the latter is carbonated to precipitate sodium bicarbonate and the precipitate is removed.—A.P.-C.

Causticizing Alkali Metal Carbonate Green Liquor of Kraft or Soda Pulp Processes. John S. Bates, Harris S. Chalmers and Percival C. Austin. U. S. pat. 1,815,646 (July 21, 1931).—A small quantity of alkali carbonate liquor is agitated with the sludge of a previous causticizing operation containing slaked lime in quantity less than the molecular equivalent of the alkali metal carbonate present until substantially all the calcium hydroxide is converted into calcium carbonate and after partial settling the partially causticized alkali liquor is drawn off, mixed with additional alkali carbonate liquor, and causticizing is completed with the addition of an equivalent proportion of slaked lime, calculated on the amount of alkali carbonate originally present in both quantities of alkali carbonate liquor (the remaining unchanged lime being used for preliminary treatment in the next cycle of operations).—A.P.-C.

Furnace for Recovery of Black Liquor. Charles L. Wagner assignor to The J. O. Ross Engineering Corp. Can. pat. 314,-640 (Aug. 25, 1931).—For furnacing kraft black liquor the make-up chemicals or salt cake is delivered to the furnace in closer proximity to the fuel bed by means of an air jet and a small portion of sprayed liquor is added to the metering jet of air-borne chemical. This cools the surface of the fuel bed and prevents flaming combustion with consequent oxidation and preserves a more highly reducing atmosphere through the fuel mass.—A.P.-C.

Chemical Wood Pulp. George A. Richter assignor to Brown Co. U. S. pat. 1,817,525 (Aug. 4, 1931).—Raw cellulose material such as spruce chips is cooked in an ammoniated liquor containing ammonium sulphide at a high temperature and under pressure. Cooking may be completed in a solution containing caustic soda.—A.P.-C.

Pulp from Reeds and "Carrizo" Plants. José M. Estape. U. S. pat. 1,817,548 (Aug. 4, 1931).—Reed (Cana brava) and "carrizo" stalks are crushed and the resulting bagasse is boiled with water in 8.5 to 10 times the quantity by weight of the bagasse containing caustic soda and sodium sulphite under pressure and the pulp is treated with hydrochloric acid gas, the pulp and gums are separated and the liquor is separated from the pulp which is crushed. It is suitable for use in pyroxylin or rayon manufacture.—A.P.-C.

Process for the Removal of Silicic Acid from Alkaline Waste Liquors of Pulp Mills Which Contains Silicic Acid, Resulting from the Treatment of Grasses, Especially Straw, Bamboo, Reeds, Etc. Carl G. Schwalbe, Eberswalde. Ger. pat. 522730 (Jan. 1, 1929).—Carbon dioxide is introduced into the black liquor and the jelly like silicic acid resulting is made into a crystalline mass by cooking, that is, by heating under pressure. This mass can be filtered and separated from the liquor.—J. F. O.

Process for the Removal of Silicic Acid from the Waste Liquor in the Manufacture of Pulp. Procedes Navarre Societe Anonyme, Lyon, France. Aust. pat. 122528 (Dec. 15, 1930).—The waste liquor is led, in a hot condition, over the desired plant or animal materials which are in a condition to give acids by hydrolysis. In this manner, the process goes to neutrality whence the entire silicic acid is separated and removed by a separation process such as centrifuge, filtering, pressing, etc., from the liquor.—J. F. O.

Sulphite Process

Apparatus for the Concentration of Waste Sulphurous Liquors. Anon Papeterie 53: 1142-1146 (Sept. 25, 1931).—A brief description of the ring type of evaporator (constructed in Europe by Escher Wyss), with a comparison of its performance and that of a quadrupla effect evaporator.—A.P.-C.

New Sulphite Pulp Mill O/Y Waldhof A/B in Kexholm Finland. Wochbl Papierfabr 62, No. 29; 691-692 (July 18, 1931). Papier-Fabr. 29, No. 29: 538-539 (July 19, 1931).—Description of the sulphite mill at Kexholm which was two years under

construction. The capacity of the mill is 80,000 metric tons sulphite pulp which is manufactured principally for the production of artificial silk. The power is produced by 3 Stal turbines, and the steam from 5 high pressure boilers operating at 45 atmospheres. The water comes from the adjoining lake and is soft and pure, requiring only a filtration. There are 8 vertical digesters of 340 cubic meters capacity. The stock is screened by Biffar knotters and diaphragm screens. Bellmers and Thorne towers are used for the bleaching.—J. F. O.

Other Digesting Processes

New Method for Preparing Cellulose from Wood. Yrjo Kylander Tek. Foren. I Finland Finland Forhandl. 51:253-257 (1931); Chem. Amstr. 25: 5759.—The method consists in a preliminary impregnation of the chips at a regulated hydrogen ion concentration with chemicals that prevent carbonizing. Higher temperatures and shorter cooking times are the result. No details of the process are given.—C. J. W.

Paper Pulp from Hardwood. Eric Wahlforss assignor to Arthur D. Little Industrial Corp. U. S. pat. 1,816,879 (Aug. 4, 1931).—Wood in chip form is subjected to the action of organic compounds derived from the hardwood itself when heated in the presence of water to a temperature corresponding to a steam pressure of 75 to 100 lbs. per sq. in. until the organic encrusting substances contained in the hardwood are softened and rendered plastic, and the fibrous mass is capable of further separation and conversion into pulp without chemical treatment on mechanical grinding.—A.P.-C.

Digesting Material to Form Pulp. Charles R. Van de Carr, Jr., Assignor to Chemipulp Process, Inc. U. S. pat 1,818,913 (Aug. 11, 1931).—After digestion, the pulp is withdrawn from the digester and washed, and spent liquor from the washer is fed into the pulp leaving the digester to dilute the pulp.—A.P.-C.

Beating

Breaker Beater. Vorbruggen. Zellstoff Papier 11, No. 8; 468-469 (Aug, 1931).—The triplex installation with the breaker beater, system "Kuhn" for the treatment of old paper and its method of operation are described. In the breaker beater, the roll is used for tearing apart and putting in solution the old paper, there being no bed plate. The knives of the roll are much stronger than those on the ordinary beater roll. The stock leaves the breaker beater through holes 8 millimeters in diameter, at about 7 per cent consistency from which it is continuously fed to a Mosebach press where it is pressed to a consistency of from 30 to 35 per cent. The stock is then furnished to the beater or a stock chest.—J. F. O.

Automatic Regulating of the Position of the Plug in Jordans. C. Weil. Zellstoff Papier 11, No. 8: 471-474 (August, 1931).—The position of the plug is changed by the regulator which is acted upon by the variation in consistency of the stock being jordaned. The arrangement, construction and operation of each component is described. This method of control eliminates the variations in hydration of the stock.—J. F. O.

Some Chemical and Physical Observations on Hydration. Otto Kress and Harold Bialkowsky. Paper trade J. 93, 20: 35-44 (Nov. 12, 1931).—A description is given of work undertaken on bleached Mitscherlich sulphite pulp with a view to determining the physical and chemical effects produced by beating—A.P.-C.

Parker-Young Co. Solves Knotty Problem. Anon. Paper Trade J. 93, No. 18: 56 (Oct. 29, 1931).—A brief description of the Meyers-Mesco consistency regulator installation at the Lincoln, N. H., mill of the Parker-Young Co., which permits of obtaining uniformity of stock density before the beaters.—A.P.-C.

Practical Bandless Beater Roll. J. D. Haskell. Dilts Machine Works, Inc., Fulton, N. Y. Paper Trade J. 93. No. 18: 62, 64, (Oct. 29, 1931).—A brief description of the Dilts bandless beater roll.—A.P.-C.

Sorption of Water Vapor by Paper Making Materials. I. Effect of Beating. C. O. Seborg and A. J. Stamm. Ind. Eng. Chem. 23: 1271-1275 (Nov., 1931).—Measurements were made of the moisture content-relative humidity and moisture content-electrical conductivity relationships of pulp and stuffs. An apparatus was designed for measuring the relative humidity relationship of materials at atmospheric pressures, using a method in which air, humidified by passing through various saturated salt solutions to give the desired relative humidities, was circulated about the absorbent material suspended from a sensitive quartz-helix balance. The extensions of this balance were measured with a cathetometer. The hydration (hygroscopicity) of the pulp, which the regularity of the curves showed to be physical rather than chemical, was not affected by beating. Electrical conductivity-moisture content relations likewise showed no differences between beaten and unbeaten pulp. The so-called hydration of the paper industry is not a true hydration, but is probably a phenomenon of fiber-fiber bonding rather than of fiber-water bonding.—A.P.-C.

New Method of Beating Stock. Anon. Pacific Pulp Paper Ind. 5, no. 12:19-20 (Nov., 1931).—Description of a new Pacific coast development, the "stockmaker," a vertical type beater, which puts the beater room on a continuous process basis.—C. J. W.

Bleaching

Process and Arrangement for the Bleaching of Wood Materials, Pulp and Similar Substances Which Is Conducted Through a Pipe by Means of Compressed Air. Firma J. M. Voith, St. Polten, Austria. Aust. pat. 122,500 (Dec. 15, 1931.)—The invention is for the purpose of attaining the highest possible uniform addition of the bleaching liquor to the stock as well as in uniform quantities to a stock of high consistency (25 to 40 percent pulp content). The bleach liquor is added to the stock shortly before or while the stock is being fed into the compressed air unit. Since the bleach liquor is here added by means of compressed air at high velocities it becomes well mixed with the individual fibers. The quantity of bleach liquor added depends upon the amount or pressure of compressed air.—J. F. O.

Control of Viscosity in the Bleaching of Pulp. Hazime Okada and Eizi Hayakawa. Royal Technical Institute, Tokyo. Cellulosechemie 12, No. 6: 153-158 (June 7, 1931).—The influence of the various factors in the bleaching of pulp such as bleaching temperatures, consistency, active chlorine, alkalinity of the bleaching solution, etc., on the measurement of the viscosity of the pulp according to the nitration method of Okada are determined. The bleaching process can be more accurately controlled by means of the viscosity method than by the usual methods of copper number and alpha cellulose. A great number of tables and other data accompany the article.—J. F. O.

Bleachability Tests in the Mill. N. W. Coster and E. Richter Paper Makers' Monthly J. 69: 422-424 (Oct. 15, 1931).—After a brief review of the principle tests that have been proposed for determining the bleaching properties of pulps, the following is recommended as suitable and satisfactory for mill control: Centrifuge a suitable amount of wet stock under given conditions for 2-5 min. or else wrap a ball of wet pulp in a piece of felt and pass twice through a wringer under standardized roll pressure (to bring the pulp to known moisture contents), to 5 g. of centrifuged or pressed pulp (corresponding to about 2 g. of air-dry pulp) add 132 cc. of water, stir thoroughly, add 50 cc. of decinormal potassium permanganate mixed with 25 cc. of 10% sulphuric acid, rinse the beaker with 20 cc. of water, after exactly 2 min. of continual stirring add 50 cc. of decinormal ferrous ammonium sulphate solution (39.21 g. ferrous ammonium sulphate and 50 cc. concentrated sulphric acid per 1.), rinse the beaker with 20 cc. of water, stir, filter, titrate the excess ferrous salt with potassium permanganate and obtain the percent bleach required from the curve given in the article.—A.P.-C.

Technical Association Testing Division

The work of the testing division of the Technical Association of the Pulp and Paper Industry is of interest to every member of the association and in order that the members may have full information as to the activities of the committees in this division the following outline has been prepared.

Under the reorganization by the executive committee in 1930, of the entire committee structure of the association, the testing division includes the following four committees: fibrous materials testing committee, paper testing committee, pulp testing committee and the non-fibrous materials testing committee. The testing division in the reorganization takes over the activities of the former standard testing methods committee, which committee had previously established a definite procedure for the adoption of standard testing methods.

The work of the committees may be divided into two general divisions as follows:

(1) Presentation of papers describing testing methods and testing equipment developed in the interest of the pulp and paper industry for the purpose of discussion at the annual and fall meetings of the association.

(2) Development of standard testing methods through cooperative research by the members of the various committees.

The following is a list of the committees of the division and their sub-committees with a brief outline of the present activities of each committee. Tentative testing methods will have been adopted for some of the materials and methods listed herein by the time of the annual meeting in 1932.

Fibrous Raw Materials Testing Committee

Species identification and other determinations of pulping qualities.

Pulp Testing Committee

(1) Physical Tests: Physical tests for the following properties of pulp will be developed: (1) An initial unbeaten or felting test; (2) Pebble or ball mill test; (3) Beater type of test; (4) Methods of sampling pulp; (5) Apparatus and methods used in making and conditioning test sheets; (6) Color of pulp; (7) Dirt content of pulp; (8) Freeness value of pulp; (9) Screen analysis; (10) Sedimentation test.

(2) Chemical Tests: Methods for the following chemical properties of pulp will be developed: (1) Isolation of cellulose by chlorination method; (2) Chlorine consumption of pulp; (3) Alpha cellulose in pulp; (4) Pitch content of pulp; (5) Acid hydrolysis; (6) Alcohol-benzene solubility; (7) Alkali solubility in 1 per cent NaOH; (8) Alkali solubility in 1 per cent NaOH corrected for water solubility; (9) Ash; (10) Beta and gamma cellulose; (11) Bleach consumption (based on 35 per cent available chlorine content in calcium hypochlorite); (12) Copper number; (13) Ether solubility; (14) Lignin; (15) Methoxyl group; (16) Moisture content; (17) Pentosan and methyl-pentosans; (18) Permanganate number; (19) Potassium hydroxide (10 per cent) solubility; (20) Viscosity in cuprammonium hydroxide; (21) Water solubility—cold; (22) Water solubility—hot; (23) Methods of test unintentionally omitted from the above list or new ones to be described at later dates.

Tentative methods have been adopted by the pulp testing committee for three of the chemical tests. (1) Isolation of cellulose by chlorination method; (2) Chlorine consumption of pulp, and (3) Alpha content in pulp.

Paper Testing Committee

1. Sub-committee on Water Resistance: Development of methods for measuring the degree of sizing or water resistance of paper.

2. Sub-committee on Chemical Methods: Work is now under way on the development of methods for the determination of (a) alpha cellulose, (b) copper number, (c) acidity, (d) pH, (e) iron, (f) copper.

3. Sub-committee on Resistance to Printing Inks: Development of method for measuring the relationship of paper to printing inks.

4. Sub-committee on Resistance of Paper to Grease: Development of method for measuring the rate of penetration of greasy or oily materials.

5. Sub-committee on Microscopical Methods.

Non-Fibrous Materials Testing Committee

Development of methods for testing materials used by the pulp and paper industry.

The methods for testing the following materials which were originally published in the TAPPI pamphlet, "Standard Methods for Testing Materials in the Pulp and Paper Industry" (1924), are now being rewritten, revised and brought up to date: Alum, bisulphite liquor, bleach, bleach sludge, casein, caustic soda, soda ash, clay, paper fillers, coal, aniline dyes, pigment colors, ultramarine, formaldehyde, gasoline, glue, lime, limestone, rosin, rosin size, sodium silicate, sulphuric acid, sulphur burner gas, sulphur, starch, starch products and water.

OUTLINE OF POLICIES FOR THE ADOPTION OF STANDARD TESTING METHODS

The following procedure for the adoption of standard testing methods was established by the former standard testing methods committee and is given here for the information of all members.

1. Object

The general chairman of the testing division shall supervise the development of standard methods of testing by the committees of the testing division and coordinate the development of testing methods being done by the Technical Association of the Pulp and Paper Industry.

A standard method can be defined as that method which is accepted by all parties concerned as being the most complete and most accurate method for the analysis of a substance. In other words it is an official method to be used in case of a dispute as to quality and is not to be confused with a routine and control method.

2. Policies

Development of standard methods.

1. A method may be developed originally by a committee or it may be taken from some reliable source such as the A. S. T. M., provided due acknowledgment is made of the source.

2. Committees preparing or selecting standard testing methods should have, if possible, representatives of producers and consumers of the article for which the method is sought.

3. Any method which has the approval of two thirds of the members of the committee in which it originates, may be presented to the association as a tentative method.

4. Tentative methods may be presented any time they may be completed but they must be published in Technical Section of Paper Trade Journal, or in Technical Association Papers and held as tentative for one year.

5. After a year, unless such serious objection has been made as to make it advisable to change the tentative method, it is voted upon by letter ballot by the active and corporate members. A majority vote for or against makes the method standard or rejects it as such respectively.

6. The secretary of the association shall conduct the vote on methods. He may submit to each member a copy of each tentative method to be voted upon with a separate ballot for each or he may prepare one ballot listing the titles of all tentative methods to be voted upon referring to the series of Technical Association Papers or Technical Section of Paper Trade Journal, where the

methods may be found. The latter is preferable as it is less costly, saving an additional printing of methods. In either case the ballot should have three columns, headed—yes or approval, no or disapproval, and not voting, and there should be a statement on the ballot requesting that members do not vote on any method unless they are qualified to do so.

7. All methods should be written according to the slightly modified standard form, of the American Society for Testing Materials, as follows:

Form and Sequence of Sub-titles in Methods of Test

Directly after the title of a method of test, insert sections of an introductory, descriptive or general character. No sub-titles shall be used for such matter. Such terms as "introductory," "general," etc., inappropriate.

The following are suggested as subjects that should be included in such introductory sections:

Statement of tests that are to be described;

Definition of the property or properties that are to be determined by the test. (It is not always possible nor necessary to include such a definition, although it is sometimes desirable. Frequently the property to be determined is so well understood that no definition is necessary);

Reference to the scope of the test and to such limitations of its applicability as the committee deems it necessary to impose;

Any further matter of a general nature.

Each of the above items shall preferably form a separate section of the method of test, with suitable marginal heading.

The matter following these opening sections shall be grouped in general under the following sub-titles in the sequence indicated.

I. Apparatus

It is intended to include under this sub-title a description of the more important apparatus required to make the test, such apparatus as the committee feels it is necessary to describe accurately either in text or by illustration.

In general, the description of each piece of apparatus shall be given in a separate numbered section, for which the marginal heading shall be the name of the apparatus described. Thus, the description of a thermometer should appear as a separate numbered section with the marginal heading "Thermometer."

II. Test Specimen

It is intended to include under this sub-title such matters as the following, treated in separate numbered section:

Directions as to treatment of material from which the sample or specimen for test is to be obtained;

Note:—If, in the judgment of a committee, directions for the treatment of materials are of such importance as to warrant separate mention under a suitable sub-title, and especially in the case of directions for treatment of material for which several tests are given in the method, such directions may be given among the opening sections of the method of test, with suitable sub-titles.

Description of the form and dimensions of the test specimen or test sample, including necessary directions for preparation of the specimen or sample.

III. Procedure

It is intended to include under this sub-title the following, each item being contained in a separate numbered section with suitable marginal heading:

Description of procedure to be followed in making a test, in such detail as may be necessary;

Statement or any precaution that should be observed;

Directions for calculations where necessary;

Directions for check tests if any.

IV. Reporting

Method of reporting results where this is felt to be necessary by the committee.

V. Precision

It is intended to include under this sub-title any statement that may be necessary as to the limit of accuracy to be expected in the test described; or to specify the agreement that is desired between duplicate determinations.

VI. Special Sub-titles

Sections that cannot appropriately be placed under any of the above sub-titles shall be grouped under special sub-titles; inserted in their most logical position. Such special sub-titles shall be indicative of the contents of the sections to which they pertain. The use of such sub-titles as "General," "Miscellaneous," etc., shall be avoided.

In so far as the above sub-titles are used, the sequence in which they are given shall, if possible, be adhered to.

In case of short methods of test, and especially in arranging a series of short tests that form parts of a general method of testing, it is permissible to omit sub-titles where the test can be suitably divided by the appropriate use of marginal headings.

VII. Additional Information

Give general information such as reference to original source of method, etc.

8. Tentative methods must be submitted to the general chairman of the testing division for his approval with a record of the vote of the originating committee before being submitted to the association.

9. A tentative method written according to the standard form herein prescribed, having the approval of two thirds of the members of the committee in which it originates, if approved by this committee, is to be submitted to the secretary of the association for presentation to the members at large.

Publication of Methods

(1) All standard methods should be published in one book or pamphlet combining all TAPPI standard methods for testing paper, pulp and all materials or anything for which there is a standard method of testing.

(2) A new issue of TAPPI standard methods of testing should be published every three or five years.

(a) In case a large number of methods are adopted as standard between such issues a supplement to the latest volume of standards should be issued.

(3) Separate copies of each method should be printed or mimeographed so that one or more methods would be available at a nominal sum to those not desiring to have the complete set of standard methods.

(4) Preparation of TAPPI publications on standard methods of testing should be under the direction and supervision of the executive committee.

Coordination of Work

(1) The chairman of every committee developing testing methods should submit to the general chairman of the testing division the program of work for the year as soon after the spring meeting of the association as possible.

(2) The general chairman of the testing division has authority to place work in the committee which in his judgment it belongs.

Miscellaneous

(1) The general chairman of the testing division should recommend to the executive committee, members or committees of TAPPI to cooperate with other organizations in the development of standard methods.

(2) It is the duty of the general chairman of the testing division to keep the executive committee fully informed at all times regarding work of this and all committees, so far as the developments of standard methods of testing is concerned.

(3) In supervising the development of standard methods the division chairman should encourage the various committees to develop or select standard methods for all products and materials involved in any way in the pulp and paper industry.

(4) It is the purpose of the general chairman to assist other committees in every possible manner in supervising the development of and in coordinating the work on standard methods of testing.

E. O. Reed, General Chairman.

A Study on the Bleaching of Kraft Pulp*

By Otto Kress[1] and Roy L. Davis[2]

Unbleached kraft pulp, in view of its high lignin content, (from 4 to 10 per cent) is difficult to bleach, 20 to 40 per cent bleaching powder being required, depending on the rawness of the pulp, and a decrease in strength and yield results. With some pulps it has been found impossible to bleach to a satisfactory white color without losing too much strength. This factor has limited the use of kraft pulp to the bag and wrapping grades of paper and for the manufacture of container board or in general where strength of the finished paper or board and not the color is of primary importance. Recently, however, there has been a tendency to bleach kraft more and more. At first only a slight bleaching was made, mainly by mills making colored paper, for the purpose of brightening the shades. Although this treatment does not lower the strength to any extent, the pulp is far from being bleached, in comparison with a bleached sulphite pulp.

Previous Work

Strangely enough, there has been only a small amount of work published on the bleaching of kraft pulp. Sutermeister[4] reported that the strength of a commercial kraft increased during bleaching even when as much as forty per cent bleach was used and the color obtained was below that of a bleached sulphite pulp. Working on maritime pine kraft pulps, Michael-Jaffard[3] found that a satisfactory white was obtained by chlorinating and extracting with alkali. This process gave a better white than bleaching with hypochlorite. The pulp was very low in alpha content (63-68 per cent) but the strength was still satisfactory. Haegglund and Urban[4] worked on difficultly bleachable kraft pulps and drew the following conclusions: "It is possible to bleach a highly lignified pulp by a two stage bleach consisting of chlorine gas in the first stage and alkaline hypochlorite in the second. In the chlorine gas prebleach, the stock is considerably strengthened. In the second or hypochlorite stage, the strength drops, but not below that of the original pulp." Curran, Doughty, and Bray[7] bleached easy-bleaching kraft pulps made from Southern pines. They obtained the best results when the pulps were first chlorinated with an amount of chlorine equivalent to about forty five per cent of the total bleach requirement. The pulps were then bleached with hypochlorite up to the desired color. Under these conditions, the strength of the bleached pulp was better than that of the unbleached.

Outline of Work

The aim of this work was to bleach a difficultly bleachable kraft pulp to a color approximately that of a bleached sulphite pulp with a minimum loss of strength. The kraft pulp used for bleaching was a high grade spruce kraft cooked to give maximum strength. This pulp was obtained in lap form at about 40 per cent bone dry.

Approximately 3000g. samples of this kraft pulp were accurately weighed on a torsion balance. A large number of these samples were weighed at one time in order to avoid changes in the moisture content and the individual lots of pulp wrapped and stored in asphalted paper, a composite moisture test being made. The wet pulp for each determination was put in a ten gallon crock and enough water added to permit disintegration of the pulp by hand and enough water then added to make the desired consistency. The pulp was intermittently agitated by hand during the bleaching process. Bleached samples were thoroughly washed with tap water and air dried over a radiator. Samples for chemical tests were shredded to a fine condition in the laboratory shredder.

The bleached pulps were compared with the original unbleached pulp in the following respects:

1. Bursting strength (Mullen) and freeness (Schopper-Riegler) test.
2. Alpha Cellulose content.
3. Copper number.
4. Cuprammonium viscosity.

The beating for strength tests was done in a Valley Iron Works' Company one and one half pound beater. Approximately thirty pound sheets (24 x 36-480) were made and their bursting strength determined on the Mullen tester. Strength tests are expressed in this report as the number of points Mullen per pound ream weight of the paper times one hundred (per cent Mullen). Strength after fifteen minutes beating and the maximum strength developed is given in the tables. Freeness tests are also given at these points. The method for determining alpha cellulose content was that of the American Chemical Society.[7] Copper numbers were determined by the Schwalbe-Brady[8] method. The cuprammonium viscosity was carried out by the method described by Bialkowsky.[9] All figures are the average of two determinations. The color standard was that of the highest grade commercial bleached kraft obtainable. This color is very nearly as good as that of the highest grade of bleached sulphite. Color comparisons were made with the eyes alone, in the daylight. Numerical values are used to designate the color of the bleached pulps. These values are explained as follows:

−4 far below standard
−3 considerably below standard
−2 slightly below standard
−1 very slightly below standard
Std. standard
+1 very slightly above standard
+2 slightly above standard
+3 considerably above standard
+4 far above standard

The bleach consumption is expressed as the per cent of bleach containing 35 per cent available chlorine, based on the bone dry weight of stock. All percentages in the tables represent the per cent of material specified, based on the bone dry weight of stock.

The bleaching experiments were divided into the following groups:

I. Single stage hypochlorite bleaching. (By hypochlorite bleach is meant the ordinary bleaching powder in which lime is the base.)

II. Multiple stage hypochlorite bleaching.

III. Combination two stage hypochlorite bleaching and sodium bisulphite bleaching.

IV. Combination two stage hypochlorite bleaching with intermediate alkaline treatments.

V. Combination two stage hypochlorite bleaching consisting of:

1. Regular hypochlorite bleaching.
2. Alkaline wash.
3. Alkaline hypochlorite bleaching.

VI. Combination chlorine and hypochlorite bleaching.

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* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Kalamazoo, Mich., Sept. 24-26, 1931.
[1] Member TAPPI, Technical Director, The Institute of Paper Chemistry, Appleton, Wis.
[2] Assoc. Member TAPPI, The Paper Makers Chemical Corporation Scholar, The Institute of Paper Chemistry, Appleton, Wis.

VII. Two fold chlorination and alkali extraction followed by hypochlorite bleaching.

VIII. Combination chlorination and alkaline hypochlorite bleaching.

IX. Combination two stage bleach consisting of:
1. Strongly alkaline hypochlorite bleaching.
2. Intermediate wash with water.
3. Regular hypochlorite bleach.

X. Combination two stage bleach consisting of:
1. Chlorine gas in presence of NaOH.
2. Intermediate water wash.
1. Chlorine gas in presence of NaOH.

XI. Combination two stage bleach consisting of:
2. Intermediate water wash.
3. Hypochlorite bleach at high density.

XII. Combination chlorination and mild alkaline extraction consisting of:
1. Chlorination.
2. Water wash followed by a mild alkaline treatment (1 per cent caustic based upon the weight of the pulp or sufficient alkali to neutralize the acidity, leaving an excess of 1 per cent caustic soda). Alkaline treatment to be followed by water wash.
3. Hypochlorite bleach at high density.

EXPERIMENTAL

I. Single stage hypochlorite bleach.

This is the simplest type of bleach and was made to obtain data for comparison with the more complicated methods of bleaching. The details of this experiment together with the physical and chemical constants on the bleached pulp are given in Table I. Constants on the unbleached pulp are included for comparison.

II. Multiple stage hypochlorite bleach.

Much work has been done on multiple stage bleaching during the past ten years. The reason for this becomes obvious upon looking at the consumption of bleach vs. the time curve of the bleaching operation[10]. About seventy per cent of the bleach is consumed during the first hour. If the pulp is washed at this stage and then bleached to the desired whiteness, a saving of twenty five per cent of the bleach, and a saving in yield and strength is said to be obtained. The mechanism of the bleaching action in the first and second stages has been studied by Rys[11], Wenzl[12], and Hochberger[13]. These investigators conclude that the first step is a chlorination or delignification process and the second purely an oxidation process. Opinions regarding the amount of bleach and the density to be used in the various stages differ very widely. Hatch recommends using 75 per cent of the bleach at low density in the first stage, followed by the remainder of high density (17 per cent). Hochberger considers it best to use one third to one half of the bleach at high density in the first stage with the remainder at low density. This view is supported by Heuser[14]. In the following experiment both stages were at 4 per cent consistency (bone dry basis). The results are shown in Table II under heading No. 2 bleach.

TABLE I
SINGLE STAGE HYPOCHLORITE BLEACH

Pulp	Unbleached Kraft pulp	Bleach	No. 4 Bl.
Bleaching conditions			
Bleach consumption	.....		32.8
Time in hours	.....		10½
Temperature deg. C	.....		37
Strength			
15 minutes	109		89
Maximum	166		116
Time for maximum	75		45
Freeness			
15 minutes	830		810
At maximum strength	335		435
Chemical tests			
Alpha cellulose	86.75		76.45
Copper number	0.96		3.07
Cuprammonium viscosity	51.4		11.0
Color	.....		—4
Yield	.....		97.6

TABLE II
MULTIPLE STAGE HYPOCHLORITE BLEACH

Pulp	kraft pulp	Bleach	No. 4 Bl.
Bleaching conditions—first stage	Unbleached	No. 2	
Bleach consumption	.....	19.7	.....
Time in hours	.....	1½	.....
Temperature deg. C.	.....	37	.....
Bleaching conditions—second stage			
Bleach consumption	.....	5.0	.....
Time in hours	.. ..	9	.....
Temperature deg. C.	.....	37	.....
Strength			
15 minutes	109	98	97
Maximum	166	118	121
Time for maximum	75	45	60
Freeness			
15 minutes	830	810	820
At maximum strength	335	410	245
Chemical tests			
Alpha cellulose	86.75	77.48	78.18
Copper number	0.96	3.02	2.54
Cuprammonium viscosity	51.4	12.3	11.7
Color	.....	—4	—4
Yield, per cent	.....	.....	97.5

In another multiple stage bleach the division was made into five stages as follows:

Stage	% Bleach	Time Hrs.	Temp. deg. C.
1	14.00	¼	37
2	4.00	1¼	39
3	3.00	3	37
4	3.00	4½	38
5	2.00	3½	39
Total	26.00	12½	

IV. Combination two stage hypochlorite bleaching with intermediate alkaline treatments.

This type of treatment has been largely used in the processes developed for preparing high grade bleached pulps from sulphite pulps, and is the basis of numerous patents. In a patent[16] by Richter the pulp is treated with about forty per cent of the total bleach requirement in the first stage and washed. This is followed by an alkaline treatment consisting of six to eight percent of caustic soda on the weight of the stock at about ten per cent consistency for two to seven hours. This treatment is followed by a regular hypochlorite bleach. Drewsen[17] treated sulphite pulp with bleaching powder solution from four to eight hours and washed with water. The pulp was then subjected to an alkaline refining treatment by boiling under pressure for several hours in a caustic soda solution. The refined pulp was washed and bleached with bleaching powder solution to the desired whiteness. Drewsen[18] also patented a similar process for bleaching soda and kraft pulps. In this patent is described the bleaching with five to ten per cent sodium or calcium hypochlorite in the first stage. The pulp is then treated with ten to fifteen per cent sodium carbonate in strong water solution for two hours in a digester at 60 to 100 pounds pressure. The resulting pulp is washed and further bleached with two to three per cent bleaching powder. The final pulp is of such purity that not more than four to six per cent is soluble on boiling for three hours with 10 per cent KOH solution.

In a patent assigned to the United States of America, Edwardes[19] describes a refining process as follows:

Wood chips are cooked to a raw condition by the sulphite process giving about a fifty per cent yield of pulp. This pulp is subjected to ten per cent caustic soda treatment in a concentration of ten per cent, at 148 deg. C. and fifty pounds pressure for about two hours. The resulting pulp is very soft and absorbent and of a chemical purity suitable for the manufacture of nitrocellulose.

Patents have been taken out by Rue[20] and Genberg[21] on a somewhat similar process. Egan[22] partially bleached sulphate pulp at 65-85 deg. F., and washed. The bleaching was completed at 65-95 deg. F. under alkaline conditions after which the bleached pulp was washed and treated with a mixture of sulphuric and sulphurous acid to remove some of the color.

TABLE III

TWO STAGE HYPOCHLORITE BLEACH WITH INTERMEDIATE SODIUM BISULPHITE TREATMENT

Pulp	Unbleached Kraft pulp	No. 3 Bleach
Bleaching conditions—first stage		
Bleach consumption	.....	18.0
Time in hours	.....	1¼
Temperature deg. C.	.....	38
Bisulfite stage		
Time in hours	.....	¾
Temperature deg. C.	.....	20
Second stage		
Bleach consumption	.....	7.0
Time in hours	.....	6
Temperature deg. C.	.....	38
Strength		
15 minutes	109	97
Maximum	166	124
Time for maximum	75	75
Freeness		
15 minutes	839	810
At maximum strength	335	170
Chemical tests		
Alpha cellulose	86.75	78.55
Copper number	0.96	2.70
Cuprammonium viscosity	51.4	13.1
Color	.....	—4
Yield, per cent	.....	.....

The constants on this pulp are also given in Table II, under heading No. 4 bleach.

III. Combination two stage hypochlorite bleaching and sodium bisulphite bleaching.

The method followed here is like the one described in the Kress process for bleaching kraft pulp[18]. The process as carried out and the constants on the bleached pulp are given in Table III.

Seven bleaching trials were made using the methods described in the above named patent specifications. The pulps were washed between stages with water only. The consistency was ten per cent in the first bleaching and alkaline wash stages and five per cent in the second bleaching stage. The results are shown in Table IV.

None of the results obtained in this series appear very valuable. Such a wide variation from the alpha content obtained when sulphite pulps are used is difficult to explain. It may be due to the fact that a greater part of the less resistant cellulose in kraft pulps is made up of beta rather than gamma cellulose as in the case of sulphite pulp. This finds partial substantiation in the fact that in the case of sulphite pulp, the alpha cellulose content and the one per cent NaOH insoluble content are practically the same. In the case of one of the bleached krafts, (No. 1) it was found that it had 76.45 per cent alpha cellulose content and 85.5 per cent one per cent soda insoluble content. Since the treatment given in the above bleaching trials was somewhat comparable to the one per cent soda solubility test, it may be that this offers an explanation. One per cent NaOH is not sufficiently strong to dissolve a large amount of the less resistant cellulose which will, however, dissolve in 17½ per cent NaOH during the alpha treatment.

TABLE IV

TWO STAGE HYPOCHLORITE BLEACHES WITH INTERMEDIATE ALKALINE TREATMENTS

Bleach	No. 5 Bleach	No. 6 Bleach	No. 7 Bleach	No. 8 Bleach	No. 9 Bleach	No. 15 Bleach	No. 16 Bleach
Bleaching conditions							
First stage							
Beach consumption	25	10	24	24	24	25	25
Time in hours	5½	¼	4	4	4	8½	8¼
Temperature deg. C.	15	15	15	15	15	15	15
Alkaline wash							
Alkali used	NaOH	NaOH	NaOH	Na_2CO_3	Na_2S	NaOH	NaOH
Per cent used	10	10	10	10	10	30	15
Time in hours	16	16	16	16	16	3	3
Temperature deg. C.	70	70	70	70	70	70	70
Second stage							
Bleach consumption	2.5	17.0	3.0	3.0	3.0	3.0	3.0
Time in hours	2	12	4	3	3	6	6
Temperature deg. C.	25	25	35	35	35	20	20
Strength							
15 minutes	101	91	96	89	96	..	89
Maximum	101	132	108	118	105	..	96
Time for maximum	30	75	45	45	45	..	30
Freeness							
15 minutes	785	810	800	790	770	..	450
At maximum strength	505	150	330	260	230	..	190
Chemical tests							
Alpha cellulose	81.55	80.65	80.85	80.48	80.37	78.20	77.5
Copper number	1.45	2.13	1.65	1.99	1.95	2.02	2.03
Cuprammonium visc.	11.5	14.9	12.6	12.6	11.3	7.3	8.3
Color	—2	—2	—1	—2	—2	—1	—1
Yield, per cent	96.5	97.6	97.2	..	96.8	81.4	86.8

TABLE V

TWO STAGE HYPOCHLORITE BLEACHING SECOND STAGE UNDER ALKALINE CONDITIONS

Pulp	Unbleached Kraft pulp	No. 17 Bleach	No. 18 Bleach
Bleaching conditions			
First stage			
Bleach consumption	.....	16	16
Time in hours	.....	2	2
Temperature deg. C.	.....	20	20
Alkaline wash			
Alkali used	.....	NaOH	..
Per cent used	.....	10	..
Second stage			
Bleach consumption	.....	9+2% NaOH	9+2% NaOH
Time in hours	.....	24	24
Temperature deg. C.	.....	20	20
Strength			
15 minutes	141	104	119
Maximum	169	109	135
Time for maximum	45	30	30
Freeness			
15 minutes	790	645	710
At maximum strength	370	270	440
Chemical tests			
Alpha cellulose	86.75	81.10	81.00
Copper number	0.96	0.78	1.16
Cuprammonium visc.	51.4	12.0	15.6
Color		Std.	—1
Yield, per cent	.....	93.6	96.0

V. Combination two stage hypochlorite bleaching consisting of:

1. Regular hypochlorite bleaching.
2. Alkaline wash.
3. Alkaline hypochlorite bleaching.

The question of acid and alkaline bleaching is one which has been studied by several investigators. Hottenroth[23] reported that the best practice was to use ⅔ to ¾ of the bleach in an acid bath and the remainder in an alkaline bath. Wenzl[12] considers a molecular ratio of two NaOH to one chlorine the best condition for obtaining the maximum strength of fibers. He calls this a stabilized bleach and has made it the basis of patent specifications. The use of NaOH during the bleaching process to maintain a "distinctly alkaline condition" has been patented by Richter and Schur[24].

An alkaline hypochlorite bleach was made on kraft pulp. In the tests tabulated in Table V, the first stage was at five per cent consistency, the alkaline wash at ten per cent, and the final stage at ten per cent consistency.

VI. Combination chlorine and hypochlorite bleaching.

The use of chlorine as a bleaching agent has been quite widely investigated. Work on the theory of bleaching by Kaufmann[25], Wenzl[12], and Bergquist[26] has shown that the first part of the bleaching process is essentially a chlorination. They consider this chlorination to be a continuation of the cooking or delignification process. The well known Cross and Bevan[27] process for determining cellulose depends upon the removal of lignin materials by alternate treatments with chlorine gas and sodium sulphite. Studies of the compara-

TABLE VI

FIRST STAGE CHLORINATION FOLLOWED BY HYPOCHLORITE BLEACHING

Pulp	Unbleached Kraft pulp	No. 19 Bleach	No. 20 Bleach
Bleaching conditions			
Chlorine stage			
Per cent consumed as bleach	.....	21	24
Time in hours	.....	6	8
Temperature deg. C.	.....	18	19
Second stage			
Bleach consumption	.....	6.5	5.0
Time in hours	.....	7	8
Temperature deg. C.	.....	20	20
Strength			
15 minutes	141	129	134
Maximum	169	147	146
Time for maximum	45	45	45
Freeness			
15 minutes	790	770	750
At maximum strength	370	375	260
Chemical tests			
Alpha cellulose	86.75	80.40	82.6
Copper number	0.96	2.09	1.84
Cuprammonium viscosity	51.4	18.5	17.4
Color	.....	— 4	— 4
Yield, per cent	....	....	95.6

TABLE VII

FIRST STAGE CHLORINATION FOLLOWED BY ALKALINE WASH AND HYPOCHLORITE BLEACHING

Pulp	No. 21 Bleach	No. 22 Bleach	No. 23 Bleach	No. 24 Bleach	No. 25 Bleach
Bleaching conditions					
First stage					
Per cent chlorine as bleach	24	24	12	12	12
Time in hours	8	8	¼	¼	¼
Alkaline wash					
Per cent NaOH	....	5	....	5	5
Time in hours	....	½	....	½	½
Second stage					
Per cent chlorine as bleach	....	....	11	11	11
Time in hours	....	....	7	7	7
Alkaline wash					
Per cent NaOH	....	....	....	5	5
Time in hours	....	....	....	½	½
Third stage					
Per cent bleach	6	4	6	2	2+2% NaOH
Time in hours	7	5½	7	4	5¼
Chemical tests					
Alpha cellulose	81.95	82.25	81.35	82.75	81.90
Copper number	2.28	1.63	2.23	1.74	1.76
Cuprammonium viscosity	16.8	16.2	15.7	14.2	12.6
Color	—3	—3	—2	—1	—1

tive merits of calcium hypochlorite and chlorine bleaching by Heuser and Niethammer[28] on a Ritter-Kellner sulphite pulp gave the following results.

"The chlorine consumption for a standard white using bleaching powder, amounted to 3.2 per cent, and the time was six hours. When chlorine gas was passed through, the maximum amount absorbed was 2.9 per cent, independently of the amount of gas passed through. A full white could not be obtained by this process alone. Best results were obtained with a combination chlorine gas-hypochlorite bleach, in which the chlorine gas amounted to 62-72 per cent of the total bleach requirement. The pulp was washed with water or one per cent NaOH solution between stages. To obtain the same degree of whiteness as in a single stage by this process, only about fifty per cent of the chlorine was required and the time was shortened from six hours to eighty minutes." Working on sulphite pulps, L. Rys[31] drew the following conclusions:

"By the use of the bleaching process described, namely, a preliminary extraction with alkali and partial bleaching at low consistency with chlorine water, second, extraction with alkali, and finally bleaching with hypochlorite—savings of as much as thirty per cent chlorine may be obtained. At the same time the purity of the pulp is higher than it is possible to obtain by bleaching at high consistency. It is possible also to obtain an excellent and very permanent white with difficultly bleachable pulps." Bleaching in this manner does not cause excessive chemical deterioration of the pulps. The use of chlorine as a bleaching agent was patented by de Vains and Peterson[29]. In this process the pulp is first treated with chlorine gas and after washing with alkali, bleached with bleaching powder. A laboratory study of this process was made by Opfermann[30]. He concluded that a thirty to forty per cent saving could be made by using this process. The work of Haegglund and Urban and that of Michael-Jaffard on bleaching kraft pulps with chlorine gas has already been mentioned.

The first two bleaches in this series were made without intermediate alkaline treatments. The chlorine was added to the pulp as chlorine water containing about 5 grams chlorine per liter. The consistency was five per cent in both stages. The percentage is expressed as the equivalent amount of bleaching powder containing thirty five per cent available chlorine. The results are given in Table VI. The second trial (No. 20) was treated between stages with three per cent sodium sulfite on fiber for forty-five minutes at 20 deg. C. The color of these two bleached pulps was far below standard. This was partly due to a gradual reversion of the bleached pulp to a dull yellow color during the drying.

VII. Two fold chlorination and alkali extraction followed by hypochlorite bleaching.

Upon looking over the relationships between the physical and chemical constants on the bleached pulps made thus far, it is evident that the viscosity is the only chemical constant which has any relationship to the strength. Investigations by Ross, Mitchell, and Yorsten[31] on bleaching soda pulp have shown that the maximum viscosity is obtained by a two-fold chlorination, and alkali extraction process followed by a bleach under alkaline conditions. The following bleaches were made on kraft pulp to see if a similar result could be obtained. One hundred gram samples were used for the sake of easier manipulation. The quality of the pulp was judged by its chemical constants, mainly viscosity. Varying treatments were given in order to obtain the optimum conditions. The results are given in Table VII.

VIII. Combination chlorination and alkaline hypochlorite bleaching.

Thus far only three types of bleaches have shown any marked superiority over a single stage hypochlorite bleach for the bleaching of a typical strong spruce kraft pulp. These are:

1. First stage—16 per cent hypochlorite followed by a wash with water and a second stage in which 9 per cent hypochlorite and two per cent NaOH were used.

2. First stage—10 per cent hypochlorite followed by an alkaline wash (10 per cent NaOH) and a final bleach with 17 per cent hypochlorite.

3. First stage—chlorine water equivalent to twenty per cent followed by a water wash and seven per cent hypochlorite.

Several bleaching experiments were made using combinations of the three above mentioned processes. Both stages were at room temperature at three per cent consistency. The results are shown in Table VIII.

One half of bleach number 27 was superbleached with an amount of chlorine equivalent to 1.5 per cent bleach. According to patents by Ebie and Richter [28] superbleaching with chlorine causes an additional whitening of the pulp without loss of strength. The results are also given in Table VIII.

The superbleached pulp had a much better color in the wet condition. This color gradually reverted during drying until it was very little better than that of the pulp which did not have the additional chlorine treatment. It is interesting, however, that this treatment did not affect the physical and chemical constants.

IX. Combination two stage bleach consisting of:

1. Strongly alkaline hypochlorine bleach.
2. Intermediate wash with water.
3. Regular hypochlorite bleach.

TABLE VIII

CHLORINATION FOLLOWED BY ALKALINE HYPOCHLORITE BLEACHING

Bleach	No. 26 Bleach	No. 27 Bleach	No. 28 Bleach	No. 29 Bleach	No. 30 Bleach	No. 31 Bleach	No. 32 Bleach
Bleaching conditions							
Chlorine stage							
Per cent chlorine as bleach	19	10	19	32 Superbleached with 0.5% chlorine	12	20	10
Time in hours	7	7	7		1	6	¼
Temperature deg. C.	20	20	20		20	20	20
Alkaline wash							
Per cent NaOH	..	10	..		..	..	..
Time in hours	..	½	..		..	..	..
Second stage							
Per cent NaOH	..	..	..		2	..	..
Per cent bleach	9	7	9		14	..	..
Time in hours	22	22	22		31	..	..
Temperature deg. C.	20	20	20		20	..	..
Strength							
15 minutes	123	121	121	119	128	118	118
Maximum	149	136	141	147	145	148	151
Time for maximum	30	30	45	30	45	45	45
Freeness							
15 minutes	750	750	765	720	770	778	798
At maximum strength	480	470	250	440	335	230	290
Chemical tests							
Alpha cellulose	81.50	81.15	82.10	80.80	82.55	80.85	80.00
Copper number	1.17	1.12	1.26	1.26	1.13	2.33	3.20
Cuprammonium visc.	20.1	19.8	18.2	18.4	22.2	28.6	45.0
Color	—2	—1	—2	—1	—2	..	..
Yield, per cent	98.5	98.5	..	..	..	..	..

TABLE IX
TWO STAGE HYPOCHLORITE BLEACH—FIRST STAGE STRONGLY ALKALINE

Bleach	No. 33 Bleach	No. 34 Bleach	No. 35 Bleach
Bleaching conditions			
First stage			
Per cent bleach	10	15	15
Per cent NaOH	150	150	150
Time in hours	3	8	8
Second stage			
Per cent bleach	15	10	10
Time in hours	5	4	4
Temperature deg. C.	20	20	20
Chemical tests			
Alpha cellulose	83.00	84.30	84.75
Copper number	2.36	2.46	2.52
Cuprammonium viscosity	10.0	10.1	11.9
Color	—4	—4	—4

In a process recently patented by Richter[33], kraft pulp is treated with five to twenty per cent of bleach at a concentration of five to six per cent in the presence of 100 to 175 per cent of NaOH based on the dry weight of the fiber. This treatment should give a pulp having good strength and an alpha cellulose content of 94-97 per cent. The results are given in Table IX. Both stages were at five per cent consistency. Sample 35 was superbleached with an amount of chlorine equivalent to 1.5 per cent bleach for eight hours.

X. Combination two stage bleach consisting of:
1. Chlorine gas and alkali.
2. Water wash.
3. Alkaline hypochlorite bleach.

The first two experiments in this series (Nos. 36 and 37) were made using chlorine water and caustic soda in the first stage. Since sodium hypochlorite must be quickly formed by this process the results obtained were very poor. In the next tests (Nos. 38 and 39) the pulp was made into a two per cent suspension with water and placed in a twenty liter bottle. The desired amount of alkali was added and chlorine gas was bubbled thru, while the bottle was shaken, until the color looked as if sufficient chlorine had been added. After this treatment the pulp was bleached to standard color with hypochlorite under alkaline conditions. The procedure and results are given in Table X.

XI. Combination two stage bleach consisting of:
1. Chlorine gas and alkali
2. Intermediate wash with water
3. Regular hypochlorite at high density

This set of experiments was made in a special apparatus

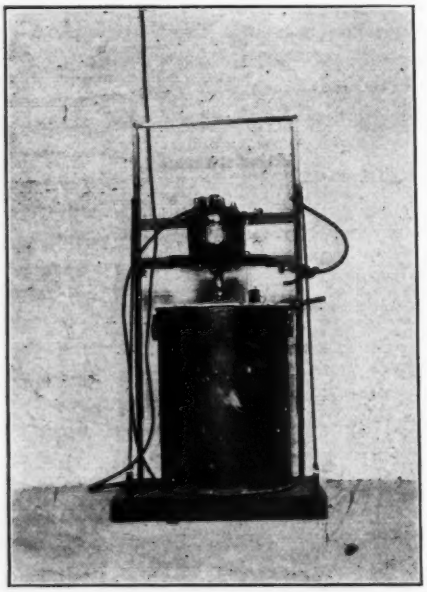


Fig. 1a

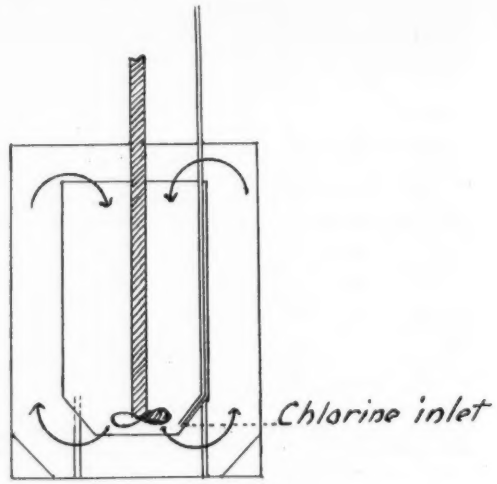


Fig. 1b

which is a model of a patented piece of equipment. The low density stage apparatus consists of a copper vessel of about twenty five liter capacity with the bottom part made into a section of a cone by a filling on the inside of the copper vessel. A hollow cylinder with a similar conelike bottom is fastened on the inside of the bleacher. The bottom of the inner cylinder is about two inches from the bottom of the outer container. The difference in diameter between the inner cylinder and outer cone is about four inches. An impeller connected with a quarter horsepower motor running at 3450 r.p.m., is placed at the bottom of the inner cone. The pulp is lifted up through the outer cylinder and falls down on the inside. Chlorine gas is lead into the pulp through a glass tube which has it outlet near the impeller. Agitation is so efficient that no chlorine escapes into the air. The apparatus is shown in figures 1a and 1b. The density used in this apparatus was 3 per cent air dry.

The high density stage was carried out in a "Hobart C10" mixer. By running the agitator ⅓ of the time, conditions of agitation and power consumption are obtained which approximate those of the Wolf high density bleaching apparatus. The density used in this apparatus was 18 per cent air dry after the bleach was added. This apparatus is shown in Fig. 2.

Several bleaching experiments were made using the above described apparatus. The results are shown in Table XI.

In order to test more thoroughly the comparative merits of bleaching with chlorine gas in the presence of alkali and

TABLE X
ALKALINE CHLORINATION FOLLOWED BY ALKALINE HYPOCHLORITE BLEACHING

Bleach	No. 36 Bleach	No. 37 Bleach	No. 38 Bleach	No. 39 Bleach	No. 40 Bleach	No. 41 Bleach	No. 42 Bleach
Bleaching conditions							
First stage							
Per cent chlorine as bleach	10	20	20	20	20	20	20
Alkali used	NaOH	NaOH	NaOH	NaOH	..	$CaCO_3$	Na_2CO_3
Per cent alkali	5	10	10	5	..	25	25
Time in hours	2	5½	½	½	3	3	3
Temperature deg. C.	20	20	20	20	20	20	20
Second stage							
Per cent bleach	16	9	6	6	7	7	7
Per cent NaOH	2	2	1	1	2	2	2
Time in hours	27	32	26	24	26	26	26
Temperature deg. C.	20	20	20	20	20	20	20
Strength							
15 minutes	109	112	126	122	120	119	107
Maximum	129	131	145	142	138	126	116
Time for maximum	45	45	30	30	30	30	30
Freeness							
15 minutes	765	730	765	730	730	695	632
At maximum strength	240	240	470	365	350	225	360
Chemical tests							
Alpha cellulose	..	..	81.75	81.00	81.27	79.40	80.17
Copper number	..	..	1.18	1.41	1.48	2.16	1.72
Cuprammonium visc.	..	..	20.8	14.5	19.0	15.1	12.6
Color	—3	—2	—2	—3	—3	—3	—3

TABE XI

ALKALINE CHLORINATION FOLLOWED BY HIGH DENSITY HYPOCHLORITE BLEACHING

Pulp	Unbleached Kraft pulp	No. 43 Bleach	No. 44 Bleach	No. 45 Bleach
Bleaching conditions				
First stage				
Per cent chlorine as bleach		15	20	16
Per cent NaOH		6	8	6.4
Temperature deg. C.		20	20	20
Time in hours		½	½	1
Second stage				
Bleach consumption		14	9	13
Time in hours		6	5	4
Temperature deg. C		20	20	20
Strength				
15 minutes	141	116	116	119
Maximum	169	145	123	147
Time for maximum	45	45	30	60
Freeness				
15 minutes	790	690	610	590
At maximum strength	370	120	222	180
Chemical tests				
Alpha cellulose	86.75	79.30	78.30	78.80
Copper number	0.96	2.86	3.22	3.00
Cuprammonium visc.	51.4	12.0	10.6	11.1
Color		—4	—4	—4

chlorine water and high and low second stage bleaching, a further set of experiments were made. The low density stage was at three percent air dry consistency, and the high stage at eighteen percent air dry consistency. The results are shown in Table XIA.

XII. Combination chlorination and mild alkaline extraction consisting of:

1. Chlorination.
2. Water wash followed by mild alkaline treatment and second water wash.
3. Hypochlorite bleach at high density.

We have shown that chlorination, followed by strong alkaline treatment (ten per cent NaOH on the weight of the pulp), and the washing and completing of the bleach with hypochlorite will decidedly reduce the strength and degrade the chemical constants of the pulp. This is contrary to the experience of other investigators and to various patents granted on the bleaching of sulphite pulp, and we believe that a kraft pulp reacts very differently from a sulphite pulp under such strong alkaline treatment.

In the chlorination of kraft pulp, the chlorine is used up by substitution, and an approximately equivalent weight of hydrochloric acid equivalent to half the weight of chlorine used is produced. The pulp suffers no chemical or physical degradation when chlorine up to 50 per cent of the bleach requirement is used. The hydrochloric acid produced can be removed by washing prior to the alkaline treatment (1 per cent NaOH on the weight of the pulp), or sufficient alkali can be added to neutralize the acid, leaving 1 per cent excess to extract the chlorinated products and coloring matters from the pulp. After this the pulp is washed until freed from colored extract, and the bleach is completed in the usual manner at high density with hypochlorite or an alkaline hypochlorite.

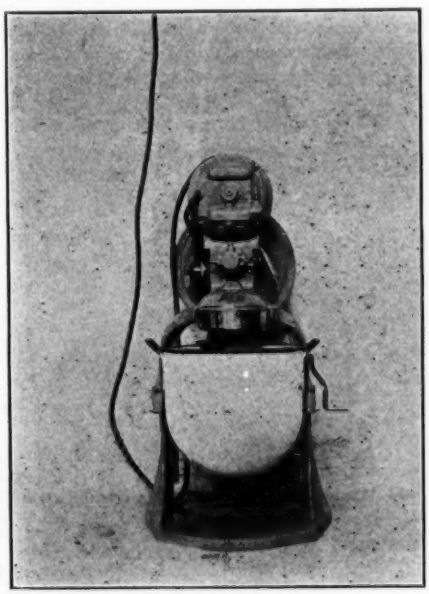


FIG. 2

TABLE XI A

COMBINATION BLEACHES WITH CHLORINE GAS AND WATER OR ALKALINE WATER FOLLOWING AFTER WASHING WITH HIGH DENSITY HYPOCHLORITE BLEACH

Pulp	Unbleached Kraft pulp	No. 46 Bleach	No. 47 Bleach	No. 48 Bleach	No. 49 Bleach	No. 50 Bleach
Bleaching conditions						
First stage						
Per cent chlorine as bleach		16	16	16	16	16
How added		Chlorine water		low-density machine		
Per cent NaOH		0	0	6.4	6.4	0
Consistency, % a.d.		3	3	3	3	3
Temperature, deg. C.		20	20	20	20	20
Time in hours		2	1¼	1¼	1¼	1¼
Second stage						
Per cent bleach		12	13	13	13	12
Per cent NaOH		2	2	2	2	2
Consistency, % a.d.		3	3	18	3	18
Time in hours		20½	26	4	50	6
Temperature, deg. C.		35	35	20	35	20
Strength						
15 minutes	141	118	127	119	112	117
Maximum	169	125	141	119	122	139
Time for maximum	45	30	30	60	30	30
Freeness						
15 minutes	790	740	735	590	660	718
At maximum strength	370	450	415	180	245	320
Chemical tests						
Alpha cellulose	86.75	82.20	81.90	78.80	78.80	82.60
Copper number	0.96	0.97	1.11	3.00	1.25	1.25
Cuprammonium visc.	51.4	23.5	22.4	11.1	14.4	16.7
Color		Std.	Std.	—4	—2	—3

We have substituted the caustic soda (which on account of convenience is the preferred alkali) with sodium carbonate, white liquor such as kraft mills produce, sodium sulphite, and lime. In every case the alkaline treatment produced a satisfactory pulp for the final hypochlorite bleach,—a pulp of good color, strength and chemical characteristics. The milder alkalis such as lime and soda ash will not extract the pulp so thoroughly, and the final bleach with hypochlorite requires more bleach and a longer bleaching time. The results of these trials which produced a pulp of highest color, strength and chemical constants are given in Table XII A and B.

TABLE XII A

COMBINATION BLEACHES WITH CHLORINE GAS FOLLOWED BY MILD ALKALINE TREATMENT AND FINAL BLEACH AT HIGH DENSITY WITH HYPOCHLORITE SPRUCE KRAFT PULP

Pulp	Unbleached Kraft pulp	No. 51 Bleach	No. 52 Bleach	No. 53 Bleach	No. 54 Bleach
Bleaching conditions					
First stage					
Per cent chlorine as bleach		16	16	16	16
How added			Low density machine		
Consistency, % a.d.		3	3	3	3
Temperature, deg. C.		20	20	20	20
Time in hours		1	1	1	1
Water Wash					
Alkaline treatment		NaOH	NaOH	NaOH	$Ca(OH)_2$
Per cent on pulp		¼	1	2	1½
Consistency, % a.d.		3	3	3	3
Temperature, deg. C.		20	20	20	20
Time in hours		1	1	1	1
Second Stage Bleach					
Per cent bleach		17	16	16	18
Consistency, % a.d.		18	18	18	18
Time in hours		8	6	7	8
Temperature, deg. C.		20	20	20	20
Strength					
15 minutes	121	126	131	116	119
Maximum	146	136	151	146	135
Time for max., min.	30	45	30	45	30
Freeness					
15 minutes	760	710	700	760	740
At max. strength	550	365	380	280	400
Chemical tests					
Alpha cellulose	86.75	79.3	81.7	82.0	80.3
Copper number	0.96	1.75	1.56	1.67	2.24
Cuprammonium visc.	51.4	19.3	16.5	17.2	12.9
Color		—2	—1	Std.	—2

TABLE XII B

COMBINATION BLEACHES WITH CHLORINE GAS FOLLOWED BY ALKALINE TREATMENT AND FINAL BLEACH AT HIGH DENSITY WITH HYPOCHLORITE
JACK PINE PULP

Pulp	Unbleached Kraft pulp	No. 55 Bleach	No. 56 Bleach	No. 57 Bleach	No. 58 Bleach	No. 59 Bleach
Bleaching Conditions:						
First Stage						
Per cent chlorine as bleach	...	16	16	16	16	16
How added	...		Low density machine			
Consistency, % a.d.	...	3	3	3	3	3
Temperature, deg. C.	...	20	20	20	20	20
Time in hours	...	1	1	1	1	1
Water wash	...	..	..	..	..	..
Alkaline Treatment						
Alkali	...	NaOH	$Ca(OH)_2$	Na_2CO_3	White liq. as Na_2O	Na_2SO_3 liq. as Na_2O
Per cent on pulp	...	1	1½	2	1½	4
Consistency, % a.d.	...	3	3	3	3	3
Temperature, deg. C.	...	20	20	20	20	20
Time in hours	...	1	1	1	1	1
Second Stage Bleach						
Per cent bleach	...	19.4	23.1	21.4	20.3	20.3
Consistency, % a.d.	...	18	18	18	18	18
Time in hours	...	10	14	12	11	13
Temperature, deg. C.	...	20	20	20	20	20
Strength						
15 minutes	108	110	113	111	113	111
Maximum	133	131	130	121	129	124
Time for max., min.	45	45	60	45	30	30
Freeness						
15 minutes	815	750	730	720	730	695
At max. strength	280	180	90	170	350	300
Chemical Tests						
Alpha cellulose	89.4	83.4	81.00	80.4	83.2	80.4
Copper number	1.11	2.39	2.17	2.24	1.95	2.33
Cuprammonium visc.	61.9	15.0	14.0	17.4	20.8	15.8
Color	...	—1	—3	....	....	....

Conclusions

In our work the following points have been indicated:

1. Kraft pulp cannot be bleached to a high color by single stage hypochlorite bleaching without considerable chemical degradation of the pulp and loss in strength. The resulting pulp hydrates too rapidly, thereby producing upon beating a hard, parchmentized, tinny sheet.

2. The results obtained by bleaching with hypochlorite in two or more stages were practically the same as in the single stage bleach insofar as chemical degradation and loss in strength are concerned, but a saving in bleach is secured.

3. Intermediate strong alkaline treatment for hypochlorite bleaches helps somewhat in attaining a high color, but the bursting strength is considerably lowered. Contrary to the results reported for sulphite pulp, the pulp seems to be considerably softened by these treatments. The alpha-cellulose content of the bleached pulp is not appreciably raised.

4. The addition of sufficient alkali in the second stage to maintain an alkaline condition raises the strength and chemical constants of the bleached pulp.

5. Chlorine, either as the gas or dissolved in water, causes very little degradation of the pulps even when amounts equivalent to 20 per cent of bleach are used.

6. The use of strong alkaline washes (10 per cent NaOH based upon the weight of the pulp) between chlorinations does not appear to be of any value.

7. Bleaching with hypochlorite with a large excess of alkali does not give a pulp having either high strength or high chemical constants.

8. The use of a small amount of chlorine as a super-bleach does not cause very much degradation of the pulp. The color, however, has a tendency to revert back to the yellow color.

9. The use of alkali in the chlorination stage does not show any advantage over the use of chlorine alone.

10. Chlorination followed by a water wash or sufficient alkali to neutralize the acid and leave an excess of 1 per cent NaOH (based upon the weight of the pulp), followed by a water wash and completed with a hypochlorite or alkaline hypochlorite bleach produces the pulp of maximum strength, color and chemical purity.

11. Optimum conditions for bleaching this grade of pulp, as shown by our experiments, are as follows:

1. First stage: chlorine equivalent to 50 per cent of the total bleach consumption.

2. Wash with water and treat with 1 per cent alkali (based upon the weight of the pulp), or add sufficient alkali to maintain a 1 per cent excess after neutralizing the acid produced.

3. Second stage: enough hypochlorite to produce the desired white and this final bleach can best be made in the alkaline condition.

REFERENCES

[3] Curran, C. E., Doughty, R. H., and Bray, M. W. Paper Trade Jour. 92, 41 (Jan. 8, 1931).
[4] Sutermeister, E. Paper Ind. 4, 517 (1922).
[5] Michael-Jaffard, R. Papier 26, No. 3, 321-9, No. 8, 929-35 (1923), 27, No. 2, 213-9 (1924).
[6] Haegglund, E., and Urban, H. Acta Acad. Aboensis, Math. et Phys., 4, 1-19 (1928).
[7] Ind. and Eng. Chem., Analyt. Edit., vol. 1, No. 1.
[8] Burgen, J. H., and Minor, J. E. Tech. Assoc. Papers, page 273, May, 1930.
[9] Bialkowsky, H. W. Tech. Assoc. Papers, pages 195-200, May, 1930.
[10] Hatch, R. S. Paper Trade Jour. 89, No. 18, 135-9 (Oct. 31, 1929).
[11] Rys, L. Paper Trade Jour. 86, No. 15 (1928).
[12] Wenzl, H. Papierfabr. 29, 4, 49 (1931).
[13] Hochberger. Papierfabr. 26, Fest u. Auslandsheft, 66-88 (1928).
[14] Heuser, E. Paper Trade Jour. 91, 55 (Aug. 14, 1930).
[15] Kress, O. Paper Trade Jour. 91, No. 9, 47-8 (1928).
[16] Richter. U. S. P. 1,635,637 (1927).
[17] Drewsen. U. S. P. 1,283,114 (1918).
[18] Drewsen. U. S. P. 1,283,113 (1918).
[19] Edwardes. U. S. P. 1,310,694 (1919).
[20] Rue, J. D. U. S. P. 1,771,064 (1930).
[21] Genberg. Can. Pat. 297,196 (1930).
[22] Egan, O. S. Can. Pat. 300,674 (1930).
[23] Hottenroth. Zellstoff u. Papier, 2, 6-10 (1922).
[24] Richter and Schur. U. S. P. 1,639,704 (1927).
[25] Kauffmann. Z. Angew. Chem. 44, 5, 104 (1931).
[26] Bergquist. Papierfabr. 26, 593 (1928).
[27] Cross and Bevan. J. Chem. Soc. 38, 666A (1880).
[28] Heuser and Niethammer, Papierfabr. 21, 52 (1922).
[29] de Vains and Peterson. D. R. P. 283,006.
[30] Opfermann, E. Papierfabr. 19, Fest u. Auslandheft 62-5 (1921).
[31] Ross, Mitchell and Yorsten. Paper Trade Jour. 91, No. 20, 43-4 (1930).
[32] Ebie and Richter. U. S. P. 1,470,556 (1924).
[33] Richter. U. S. P. 1,773,320 (1930).

Improved Procedure for Testing Stability of Paper

In the course of previous studies considerable data have been accumulated enabling the development of a better technic for the sampling and testing of folding endurance strips in connection with the accelerated aging test made by heating paper. It was shown that the accuracy of the retention value (i.e. ratio of folding endurance of paper heated 72 hours at 100 deg. C. to folding endurance of unheated paper) was approximately doubled when folding strips were cut adjacently from the sample, using alternate strips for the control test and remaining strips for the heat test. Errors in the retention value due to variations of the humidity of the testing room and to variations among different folding machines were shown to be overcome respectively, by testing control and heated strips close together in point of time, and by using several folding machines an equal number of times in the testing of control and heated strips. An article describing this work is being prepared for publication.

Effect of Iron on Stability of Paper

There appears to be considerable scattered evidence that iron, and possibly other metals, may be an important factor in the deterioration of paper. Definite findings in this respect have been secured by various investigators in studying rubber, textiles, and other organic materials, and it is well known that iron promotes the discoloration of paper at least, on aging. As a part of its general study of the preservation of records, the Bureau of Standards is attempting to find the effect of iron in general on both the physical and chemical properties of papers as related to their stability. Papers made in the bureau mill with the addition of various amounts of ferrous and ferric iron are being subjected to heat and light, and loss of strength, decrease in chemical qualities, and degree of fading are being measured. The data for the papers that have been tested, composed of wood fibers only, show that the iron apparently had an adverse effect on their stability.

POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

Conducted by Reginald Trautschold Consulting Engineer

Stoker Firing Systems Predominate*

All Varieties of Coals and Refuse Fuels Burned Economically

At the World Power Conference held in Berlin in 1930, statistics were presented showing that out of the 450,000,000 tons of coal consumed under American boilers, 275,000,000 were fired by hand, 150,000,000 tons by mechanical stokers and 25,000,000 tons burned in pulverized form. These figures are illuminating and indicate, also, that from 60 to 80 per cent of all water tube boilers are stoker fired. Further confirmation of the preponderance of stoker firing is found in the statistics given out by the Brookings Institution, in collaboration with the United States Department of Commerce and the Bureau of Mines. These records show, not only that every kind of coal mined in the United States is being burned in substantial amounts on stokers, but that out of a total of 42,000,000 tons of coal consumed by the public utilities during the year 1928, 20,000,000 tons were burned on underfeed stokers, 12 million tons on chain grate stokers and 7,000,000 tons in pulverized form, with the balance divided substantially equally between the quantity burned on overfeed stokers and on hand fired grates.

These latter figures, showing that 81 per cent of all the coal burned in central station power plants is fired by mechanical stokers, are indicative, as well, of the situation in respect to methods of coal burning in the steam plants of the pulp and paper mills in the United States and Canada. Possibly, quite as much progress has not yet been made by the paper making industry, perhaps, there is still a greater proportion of steam generators fired by hand, and such advance as has been made may not show quite such a great preponderance of stoker firing systems, but the variations one way or the other are not of any great concern.

Courtesy: Flynn & Emerich Co.

FIG. 1

Type of semi-automatic (overfeed) stokers installed at Schroon River Pulp & Paper Co. plant, Warrensburg, N. Y.

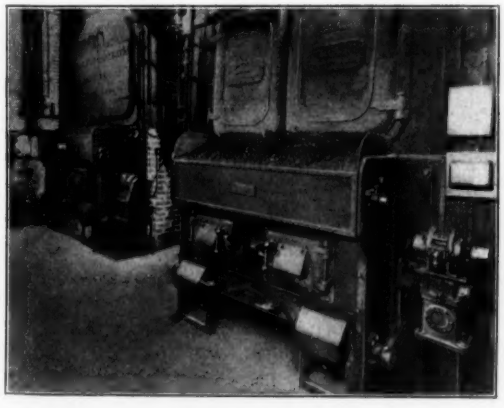
During the past decade, the combined efficiency of stokers and boilers has risen from 60 to 65 per cent to 70 or 80 per cent and with heat recovery devices up to 90 per cent. Resolved to monetary units, this represents a very considerable saving and explains, doubtless, the firm hold secured and held by the mechanical stoker among modern systems of coal firing.

Reporting upon the results secured with semi-automatic stokers under four boilers aggregating some 700 horsepower in rated capacity, seven or eight years ago, a paper making concern up in New York State advised: "We paid for these stokers . . . $7,200.00. Our records show that during a normal year's production these stokers are saving us approximately 3,000 tons of coal, which at $5.00 a ton, amounts to . . . $15,000.00." Another of these older records, one where a boiler capacity of 1,600 horsepower was concerned, shows a recorded annual saving of $12,890.00.

Efficiencies Now Secured With Semi-Automatic Stokers

The saving made by the semi-automatic (overfeed) stokers, mechanisms highly recommended for use in plants of moderate size, by which the coal is fed into the stokers by power operated pushers while the stoker bars are manually operated, is of particular interest, as only a few months ago exhaustive and noteworthy tests were con-

* For previous discussions on stokers, see Paper Trade Journal, Nov. 10, 1927; April 4 and Dec. 6, 1928; Aug. 29, 1929, and Nov. 27, 1930.



Courtesy: Neemes Foundry, Inc.

FIG. 2

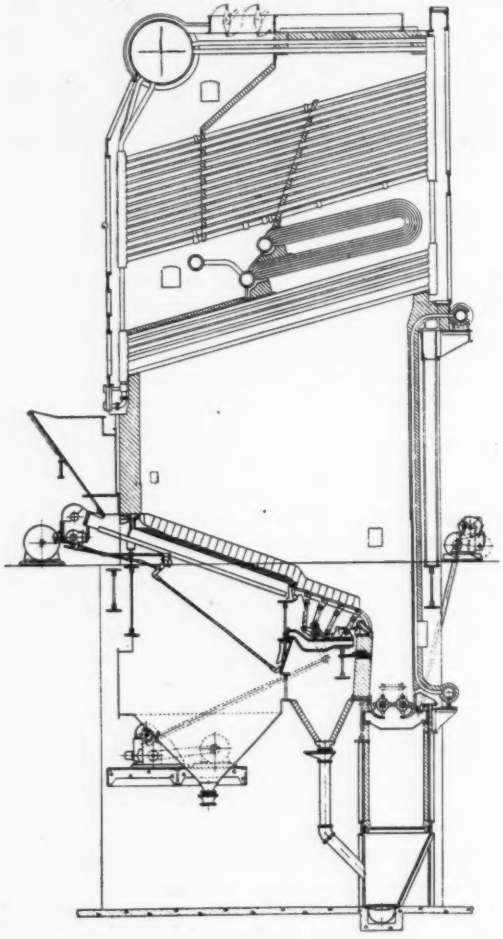
Overfeed stokers give good service at the John A. Manning Paper Co., Inc., plant, Troy, N. Y.

ducted with similar stokers at the Schroon River Pulp and Paper Company, Warrensburg, N. Y., to establish the relative value of two kinds of high grade coal. One of these coals had a calorific value per pound as fired (dry basis) of 14,180 B.t.u. and the other, 14,145 B.t.u. per pound.

With the first of these excellent fuels, an evaporation of 11.06 pounds of water from and at 212 degrees Fahrenheit was secured as fired (dry basis) and with the other an evaporation of 11.52 pounds. These attainments represent, respectively, overall efficiencies for boiler, furnace and stoker of 75.71 and 79.03 per cent.

That these results, good as they are, are not exceptional where modern stokers of this variety are employed for firing relatively small steam boilers is shown by a recent report submitted by S. O. Heiser, superintendent, Smeallie & Voorhees, Inc., paper box board producers of Amsterdam, N. Y. The statement he made is: "We are operating two ..... stokers under two ..... H. R. T., 150 horsepower boilers. At the present time these boilers are developing 362 horsepower per boiler, evaporating about 11 pounds."

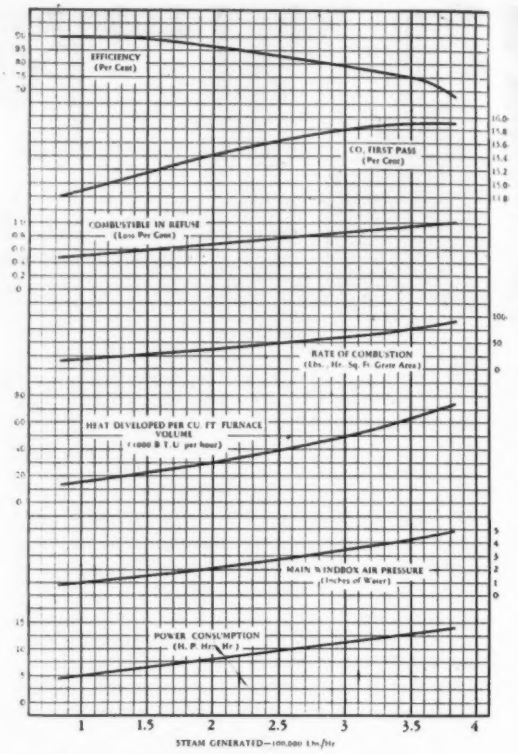
Robert Witbeck, President, the Taylor-Atkins Company of Burnside, Conn., reports very much the same experience, for in a recent communication he states: "We originally operated three boilers, all three of which were



Courtesy: Westinghouse Electric & Mfg. Co.

FIG. 3

Side elevation of 2,380 h.p. boiler showing applications of new "link-grate" stoker.



Courtesy: Westinghouse Electric & Mfg. Co.

FIG. 4

Performance record of 2,380 h.p. boiler fired with "link-grate" stoker.

hand fired. A few years back we put in two slightly larger boilers and equipped both of them with ..... semi-mechanical stokers. We find that now with the stoker equipped boilers we can carry our load along the greater portion of the time with one boiler in actual operation."

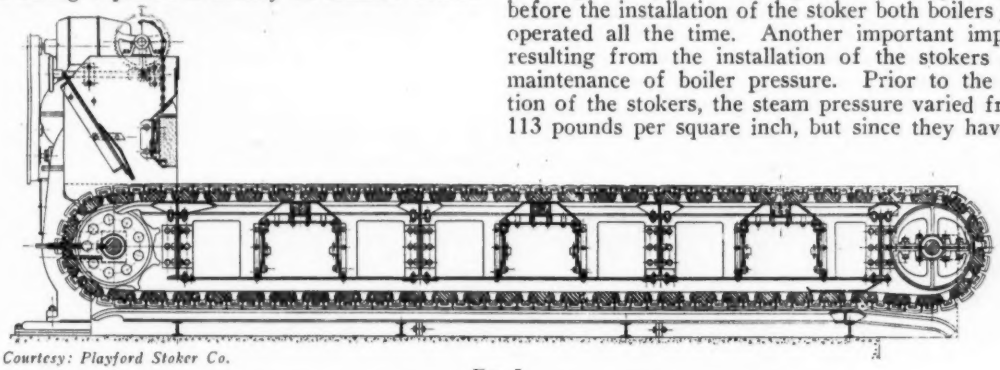
Automatic Underfeed Stoker Applications

An interesting installation of modern automatic stokers is included in the quite extensive program of improvements that has been going forward at the Abitibi Power & Paper Company, Ltd., in Northern Ontario, for in addition to the three large electric boilers operated on low-cost hydro-electric power there are ten 4,780 square foot (heating surface area) coal fired boilers, two 3,580 square foot and four 4,780 square foot refuse-fired boilers, all equipped with underfeed stokers of advanced design. Both coal and refuse fired boilers operate at 150 pounds gage pressure, 125 to 140 degrees Fahrenheit superheat, and the stoker fired coal burning boilers develop an average daily efficiency of 79.5 per cent.

The six refuse-fired boilers are supplied with stokers so they may be coal fired if necessary, though their furnaces being of the conventional Dutch oven type are not really suitable for such operation. However, the stokers are brought into play when the refuse (bark, sawdust, waste wood and rejected pulp wood)is unusually wet and it becomes necessary to add some coal to help burn the refuse. The refuse is fed through the top of the furnace directly onto the stoker, which when in use forces in an under layer of coal to support and maintain combustion. During the winter months, the supply of available refuse is plentiful and of higher quality than in summer, with the result that during the colder portion of the year the burning of refuse saves about 55 tons of coal a day, while in summer the saving is only about 35 tons per day.

The part played by stokers in effecting such savings is important and so much more is now known about furnace design than was known only a few years ago that substantially increased savings can frequently be effected by modernizing an old stoker job, whether the service entailed is the more customary one of caring for a coal fired boiler or a more specialized application such as one for stimulating combustion in a refuse fired boiler. When a stoker job is brought up-to-date, better actual operating efficiencies are maintained and the installation can be operated more economically. Savings also result from operating the boilers at higher average capacity and there is an additional gain due to more positive service and control. The one outstanding requirement to justify the cost of revamping is an actual saving in daily coal consumption and there are many instances on record where the cost of revamping a stoker installation made only a relatively few years ago has been made up in additional savings within less than a year.

In one specific instance, a saving of forty-three out of every one hundred tons of coal burned was effected. One 745-horsepower boiler equipped with a multiple retort underfeed stoker operating so as to drive the boiler at 300 per cent of rating replaced a battery of smaller boilers having an aggregate rated capacity of 2,200 horsepower. Over a period of a year, the new installation is reported to have produced 7.8 per cent more steam with 61.3 per cent as much fuel. Besides this saving in fuel costs, amounting to 43 per cent, labor has been greatly reduced, maintenance costs have been materially cut and interruptions occasioned by boiler troubles have been eliminated.



Courtesy: Playford Stoker Co.

FIG. 5

Sectional view of modern chain grate stoker containing six zones.

The ability of these stokers to meet heavy steam demands and their marked dependability are also well indicated in another comparatively new installation, where a single retort underfeed stoker developed an average of 350 per cent of rating on a 300 horsepower boiler for a continuous period of fifteen months, day and night, with only a day a month interruption for boiler cleaning, contracting in that entire time a total repair part cost of 1.1 cents per ton of coal consumed. In still another plant, where the normal load is about 50,000 pounds of steam per hour per boiler and where peaks of twelve hour duration or more frequently call for 50 per cent greater output, a boiler efficiency of 82 per cent, including preheater, is obtained over peak load periods, with an average efficiency for the entire year of 1929, including banking losses, of 78.8 per cent.

Results With Overfeed Stokers

Very good results have also been secured with overfeed, sometimes designated as gravity feed, stokers under steam generators of moderate size and also under refuse fired boilers of both large and small sizes. The type is generally acknowledged to be well suited to the burning of anthracite and non-caking coals and it would seem also well adapted to the requirements for the effective combustion of bark, sawdust, waste wood, etc., wet or dry, which do not have a tendency to fuse or clinker.

The John A. Manning Paper Company, Inc., Troy, N. Y., is one of the mills to report good results with this variety of mechanical stoker, having installed one under a boiler in 1928 and, on the strength of the savings and benefits realized, a second such unit under another boiler a year or two later. The coal saving effected alone is considered by this company a very satisfactory return on the investment entailed and much importance is placed upon the ability to operate the stoker manually should there be an interruption to the operating power supply, so making possible the avoidance of an enforced and costly shutdown.

The automatic stoking of the fires has also materially increased the steaming capacity of the boilers. When only one boiler was stoker fired, it was found that the single unit could handle the entire plant load in seasons when generally mill heating was not required, whereas before the installation of the stoker both boilers had to be operated all the time. Another important improvement resulting from the installation of the stokers is in the maintenance of boiler pressure. Prior to the introduction of the stokers, the steam pressure varied from 88 to 113 pounds per square inch, but since they have been in service the stokers keep the pressure between 105 and 109 pounds per square inch.

Still another consideration of importance has to do with the question of smoke nuisance. Prior to the installation of the stokers, smoking stacks were the cause of much annoyance, but since the boilers have been stoker fired the trouble has been entirely overcome.

A recent and very interesting application of a variety of overfeed stoker, or automatic feeders, is in connection with a combination furnace for burning waste heat gases and bark at the Southern Advance Bag & Paper Company, Inc., Hodge, La., where the bark, frequently high in moisture, is stoked, or fed, to the furnace. It is reported that bark containing 70 per cent moisture and piled 20 feet high has been satisfactorily fed to the furnace.

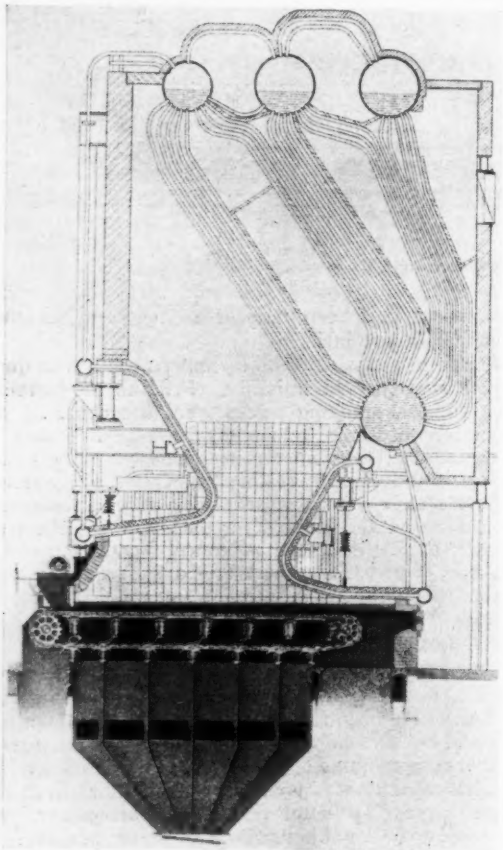
At the Panama City, Fla., plant of the Southern Kraft Corporation, a very similar installation has been made to burn bark. As originally planned, it was the intention to develop about 850 horsepower from this refuse fuel, the limitation being imposed by the amount of bark available, but extra capacity was provided and the bark-fired boiler has been averaging better than 1,400 horsepower, generating more than a million pounds of steam per day. The combustion, as shown by CO_2 charts, has been so satisfactory that the carbon dioxide constituent of the flue gases has averaged around 13 to 14 per cent. Unfortunately, further details or pertinent operating statistics are

not as yet available, but when such information can be released much more will doubtless be known regarding a question of considerable importance to many mills.

Combining Underfeed and Overfeed Operation

A stoker development of note introduced to the central station field in 1927, the first units going into service at the Hudson Avenue Station of the Brooklyn Edison Company in August, 1928, and to the pulp and paper industry in 1930, by an important installation at the Southern Kraft Corporation, Panama City, is of particular interest, not only on account of the excellent results secured with the distinctive construction, but because the stoker design combines the effective underfeed principle of the conventional large capacity stoking unit with the excellent combustion characteristics of an overfeed area and the fuel and refuse conveying ability of an undulating "link-grate" system. In other words, this new stoker, a multi-retort unit, consists essentially of an upper underfeed section and a lower overfeed section, the latter of relatively large area and composed of moving elements, link grates, that are, in construction and motion, uniform across the entire width of the furnace.

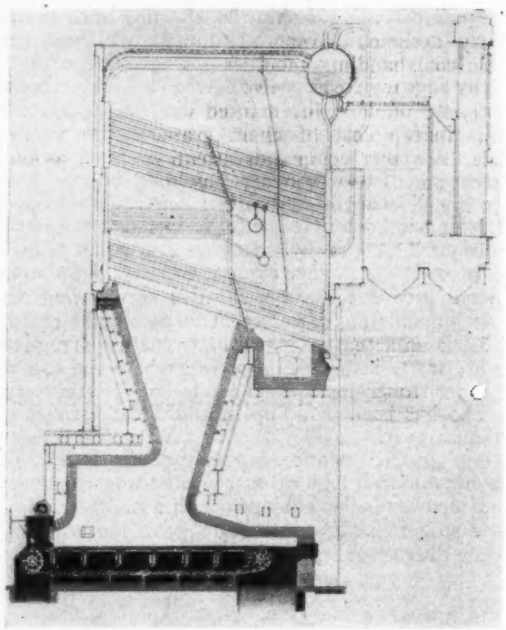
Large quantities of coal may be burned on the lower, overfeed, link grate section and the movement of the streams of burning fuel from the ends of the retorts of the upper, underfeed section continuously wipes away the ashes that habitually collect on the lower tuyères and deposits them on the undulating link grate, overfeed section.



Courtesy: The Babcock & Wilcox Co.

FIG. 7

Forced draft chain grate stoker for burning bituminous coal, as applied to a bent-tube boiler with water cooled arches and walls.



Courtesy: The Babcock & Wilcox Co.

FIG. 6

Forced draft chain grate stoker with side air admission for burning anthracite coal, as applied to water-tube boiler with refractory lined furnace.

Thus the fuel bed on the lower tuyères is kept free from clinkers and clinker formation, the cause of most of the burning of stoker parts in any stoker, and the fuel bed on the undulating overfeed section of the stoker is kept open and active, with the result that large quantities of fuel can be burned without risk of congesting the fuel bed at any point and resulting damage to stoker parts.

Central station service records show that this stoker is well able to carry very heavy loads for unusually long periods, with very high average efficiency and markedly low maintenance. These are highly desirable characteristics and the behavior of the units under the three 1,260 horsepower boilers at Panama City will certainly be followed closely. As yet, this installation is too recent to have provided much in the way of operating records of general interest.

Chain Grate Stoker Applications

While the employment of chain grate stokers has not been as general by the paper making industry as the use of underfeed stokers, one prominent stoker manufacturer has equipped some 750,000 square feet of boiler heating surface with chain, or travelling, grate stokers as against 1,750,000 square feet with underfeed stokers, a ratio of 3 to 7. This shows very conclusively, obviously, that under certain and far from uncommon conditions the chain grate stoker, with its marked ability to burn screenings from any of the non-coking, free burning coals, anthracites, coke breeze, etc., is well adapted to the needs of many pulp and paper mill steam plants. High capacities and excellent economics are easily obtained, quite frequently, with these cheap fuels that can often be purchased at very attractive rates so far as their heat content is concerned.

The clinker and ash problems that usually arise when other types of stokers are used under similar conditions are in very large part avoided, one of the distinct advantages of the chain grate stoker being that ash removal is continuous. Fluctuating loads are readily met and smoke-

less combustion is virtually assured at all times with a properly designed furnace. Chain grate stokers with suitable coal handling facilities also make for low labor costs, as one man can conveniently operate six to eight stokers, even under quite marked varying load conditions.

Low upkeep cost of chain grate stokers is another consideration that commands attention. The design and construction of the modern, high grade, chain grate stoker is such that it is probably burdened less with maintenance and upkeep costs for stoker parts than any other form of stoker suitable for burning low grade fuels.

These stokers are obtainable for use with natural draft as well as with induced or forced draft, with side or bottom air admission and in sizes from less than 100 to more than 600 square feet in effective grate surface area. Cold or preheated combustion air may be employed and compartments under the grate make possible sensitive zone control of combustion. For coals low in volatile matter, ignition arches to reflect the heat from the rear toward the front of the grate are customarily provided, but these details are all quite generally familiar.

Flexibility and Reliability

Of greater interest are incidents of unusual achievements and of typical operating records, instances and events that focus attention upon the flexibility and reliability of chain grate stoker service. For example, the ability of the Bogota Paper and Board Company, Bogota, N. J., to carry through with a full head of steam during two serious coal strikes that all but stopped the supply of any fuel at all. Buckwheats Nos. 1, 2 and 3 had been the plant fuel, but when the sources of supply for these small anthracites were closed the very finest screenings, known as "Silt," sufficed to enable the chain grate stokers to keep the power plant functioning in good shape. Obviously, this would not have been possible with any other variety of mechanical stoker.

At another plant, chain stokers were placed in operation in September, 1929, and burning wash Illinois Screenings averaging in heating value as fired only about 9,900 B.t.u. per pound, with 3.5 per cent sulphur content and 13 per cent ash, an average monthly efficiency of over 78 per cent was maintained for the first ten months. The surprising thing about this performance is, however, the fact that while the boilers were built for 400-pound working pressure and 100 degrees of superheat, they were operated during this period at a pressure of only 135 pounds per square inch, with an average CO_2 flue gas content of from 12.5 to 13.5 per cent, and when operating at about 150 per cent of rating the flue gas temperature varied between 410 and 420 degrees. At 90 per cent rating, it was 390 degrees and during the entire ten months never rose above 500 degrees.

Another Interesting Achievement

Another interesting achievement is that though the stokers and boilers are built for forced draft operation, the stokers, on low load, developed as high as 120 per cent rating on natural draft operation. During the first ten months of operation and for some time afterward, incidentally, no repairs of any kind were necessary, with the sole exception of a wash coat of high temperature cement upon the furnace walls.

It is records and achievements such as have been briefly presented that command the careful consideration of all pulp and paper mills contemplating power plant improvements, as all should at this time. A stoker firing system may not be the choice, it is true, but if it is there are now numerous varieties of stokers incorporating refinements of value from which to select. Stoker firing is efficient, economical and, today, decidedly flexible and adaptable.

10 MONTH OPERATING RECORD OF CHAIN GRATE STOKED BOILER

Month	Coal as Fired—9,900 B.t.u. per Pound			
	Coal as Fired, tons	Pounds Steam	Actual Evap., pounds	CO_2 Content
September	751.0	11,176,400	7.4	.....
October	887.2	13,848,900	7.8	10.4%
November	814.6	14,015,850	7.5	10.6
December	949.3	13,999,950	7.4	11.5
January	1006.1	15,189,800	7.5	12.0
February	824.3	11,925,000	7.2	12.1
March	959.6	14,029,100	7.3	12.9
April	912.6	13,658,100	7.5	12.8
May	787.4	12,131,700	7.7	12.8
June	711.9	11,771,300	8.3	12.7

Illinois Stoker Co.

SUE NEWSPRINT INSTITUTE

(Continued from page 16)

export to Canada, he claims, and there will have to be a branch plant put up. This will come either this year or next, and the site will be Montreal or Toronto. Mr. Huppuch himself favors Montreal, and has been looking round at sites. There is no factory available here which could be converted to the wall paper industry. In the event of his firm locating in the city, an entirely new plant would be erected. No decision will be taken in the matter for some little time, he said.

All-Water Route for News Print

Negotiations are under way between Canadian manufacturers and Buffalo steamship operators for the establishment, of a new all-water route for the shipping of news print, this having been made possible by the opening of the new Welland Canal.

Under the proposed scheme, news print thus shipped would travel via Great Lakes ports at a very material saving over the rail haul cost at present involved vessel owners claim.

While Three Rivers, Que., is named as the originating point of the proposed traffic, it is expected that other St. Lawrence Valley mills will participate in the shipping scheme. The plan for shipping news print is to have the steamers which carry grain or other freight to Montreal proceed an additional hundred miles to Three Rivers and load the paper at the mill wharves along the St. Lawrence.

The return will be made through the locks around the St. Lawrence Rapids, across Lake Ontario through the new Welland Canal and into the Great Lakes.

With the new channel completed practically every steamship hitherto operating between Buffalo and points westward will be able to enter Lake Ontario. The largest of these steamers will not be able to reach Montreal, however, until the locks of the Upper St. Lawrence are enlarged as part of the proposed seaway, now subject of negotiations between Canada and the United States as a combined power and navigation project.

If the present plans are carried out it is estimated that the 1932 movement of paper on the Great Lakes will be in excess of 500,000 tons.

Paper Output

Figures given in the annual report of the New Brunswick Department of Lands and Mines show that during 1931, 483,458 cords of pulpwood were manufactured in the pulp and paper mills of the Province, an increase of 15 per cent as compared with the amount manufactured in the previous year. The unmanufactured pulpwood exported from the Province during 1931 amounted to 171,305 cords, which is in excess of the amount exported in 1930, namely 165,280 cords.

Automatic Paper Making

By Melvin R. Ware[1]

Automatic paper-making is simply a matter of proper control of the individual units in the process of making paper, and, coordinating the various units one with the other through master controls, this accomplished should result in very nearly a hundred per cent efficient operation.

A continuous beating system is preferred in conjunction with a "direct" white water closed system. However, a batch system may be used, but it is the writer's opinion that in most cases there would be considerably greater economy in the use of the complete continuous system.

The Continuous Beating and Direct White Water System

When slush stock is used direct from the pulp mill, or when stock is pretreated in a manner that it reaches the first continuous beater containing considerable moisture, the consistency should be regulated before going to the first beater so that it can be measured to the beater by a device which will be described later. Other stocks or raw material should be proportioned in dry or semi-dry form to the first beater at production rate, plus shrinkage. The white water surplus from the paper machine should be proportioned direct from the paper machine to the first beater, thereby regulating the consistency of stock, and taking care of the surplus of white water as it accumulates. After the admission of raw stock and water to the first beater in predetermined quantity it is further desirable to control the quantity of the solution between the entrance of stock and water to the first beater and the machine, eliminating the possibility of fluctuation, permitting the use of white water as accumulated. In this connection floats or other suitable devices are used in the stock chest, beaters, tanks or other retaining receptacle for controlling the stock levels. For instance a float in the machine chest would actuate the beater chest stuff box gate, regulating the flow to the machine chest, the float in the beater chest would actuate the gate regulating the flow from the last beater in the line, the floats in the beaters would likewise actuate the gates of the preceding beaters and thereby regulate the flow from beater to beater and so on to the first beater which float would actuate the main initial feeding devices, regulating the raw stock and return white water. This completes the beater room operation taking care of the white water and assuring uniform and standard treatment.

Paper Machine Control

A stock measuring device is provided to operate in the stuff box by a suitable variable speed device which is actuated by the formed sheet, so set as to hold the sheet within tolerance by diminishing the flow if inclined to gain weight or thickness, and vice versa to increase the flow when the sheet is inclined to run light. This mechanism is so designed, or timed as not to repeat the action until sufficient time has lapsed for the correction to reach the device again, eliminating the possibility of fluctuation. The sheet may actuate the measuring device in the stuff box through an automatic micrometer, a continuous weighing scale, electrical or any suitable device, depending upon the nature of the material being made. When the flow of stock diminishes for any reason such as the slowing down of the paper machine, the floats in the chests, beaters etc., actuate the first feeding device thereby reducing the quantity of stock and water being furnished, the raw stock feeding device being so synchronized with the white water feeding device, or valve, as to maintain a definite consistency. Makeup water is added to the pump feeding beaters or showers as may be desired, compensating for evaporation at the driers, by an automatic float arrangement, or suitable device.

I fully appreciate the fact that there will be numerous theories advanced as to why certain stocks do not lend themselves readily to automatic operation, and considerable of them will be based upon the assumption that certain foreign matter, chemicals and even small fibers contained in the sheet are objectionable to the quality of product, which are at present being washed out by the white water, and therefore, a closed system would tend to retain this matter in the sheet. To this theory may I give the following explanations covering broadly several grades of stock.

Waste Paper and Roofing Rags

Any foreign matter which can not be settled, or screened out should never enter the beaters.

Chemical Pulp or Chemically Treated Stock

If chemicals or liquor is present in sufficient quantity to prevent the use of white water exclusively, then the paper machine is being used for a pulp washer, and is carrying a shrinkage charge which should be borne by the pulp mill.

Asbestos Fibre or Like Material

If the fine matter in asbestos fiber causes the stock to become too slow for formation when reusing white water, then the mines have benefited at the expense of the paper mill, as this fine matter is not papermaking material. The writer is of the opinion that all the fiber contained in a bag of asbestos fiber is suitable for papermaking, and if the "direct" white water system is employed that the white water can be used to advantage also.

Other theories or objections may be advanced along the lines that certain of the various materials used in the composition of the sheet require a different treatment than other materials in the same sheet. This we grant, and have made provision for just such emergencies, by furnishing the different materials at different stages in the operation (if found necessary) or by the use of a selective device whereby the finished fibers may be removed from the mass and the unfinished further treated, the assumption being that the difference would only be in degree of refinement.

There will no doubt be other theories advanced against complete automatic operation. However, where sufficiently long runs are made on one or similar grades, it is the writer's opinion that practically all grades can be handled automatically, and with a completely closed system.

Advantages of System

Following are some of the advantages to be expected from the use of the automatic system.

The predetermined furnish at production rate establishes a definite consistency which is very important and which provides for proper utilization of white water as accumulated, affording uniform mechanical action thereby resulting in an improved and greater standardized quality in addition to reclaiming practically all fiber, color and other ingredients.

Constant quantity stock in process, retention of heat

(Continued on page 52)

[1] Inventor, Automatic Paper-Making Systems.

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
PROVIDENCE, R. I.

Imitation Is The Sincerest Form of Flattery!

XCEM No. 70 SLIME REMOVER

XCEM #70 Slime Remover was the first compound specially developed for its purpose, and many attempts have been made to imitate it. Because of its extraordinary effectiveness however, XCEM #70 remains—today as always—the preferred choice of the Industry for cleaning the paper making system.

A Bulletin containing detailed instructions regarding the use of XCEM #70 Slime Remover and XCEM Felt Soap is yours for the asking.

This organization also specializes in the production of special cleaning compounds for individual needs. We invite your inquiry.

MAGNUSON PRODUCTS CORP.
Third and Hoyt Streets Brooklyn, N. Y.
Warehouses in Principal Cities Representatives Everywhere
IN THE UNITED STATES and CANADA

EXTENSION MODEL

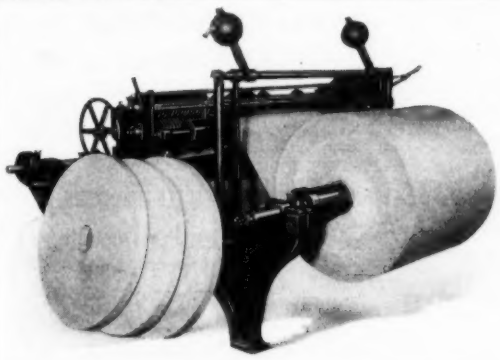
Cambridge Surface Pyrometer

is an instrument which applied to the surface of a dryer or calender roll, instantly indicates the exact surface temperature. Its use enables the operator to locate water logged rolls and to maintain every roll at the correct temperature for efficient progressive drying.

The instrument is compact, rugged and easy to read. The extension rod permits temperature checking across the entire roll. Scale ranges are 50-250° and 50-400°F.

Send for List No. 194-P.T.

CAMBRIDGE INSTRUMENT CO., INC.
3512 GRAND CENTRAL TERMINAL, NEW YORK



HEAVY DUTY SLITTER and REWINDER

Designed to meet the requirements of all users of Automatic Machines that take the stock from the roll, and require a roll of large diameter wound true and solid.

With this slitter, wide and narrow widths cut at the same time are of uniform tension. A roll slit and rewound 1" wide and 48" diameter can be handled without danger of spinning. At very little additional cost per ton paper mills equipped with this Slitter can furnish their customers with paper or board slit and rewound from 1" width and up. Made in three widths: 48"—60"—72".

INMAN MANUFACTURING COMPANY
AMSTERDAM, N. Y.

Manufacturers of
AUTOMATIC MACHINERY FOR PAPER BOXES AND ROTARY PAPER CUTTING MACHINERY

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

SUMMARY

WEEK ENDING MARCH 12, 1932

Cigarette paper	752 cs.
Wall paper	1 bl.
Paper hangings	4 cs.
News print	1696 rolls
Printing paper	29 cs.
Impression paper	23 bls.
Filter paper	22 cs.
Drawing paper	8 rolls, 88 cs.
Decalcomania paper	23 cs.
Baryta coated paper	26 crates, 2 cs.
Surface coated paper	13 cs.
Metal coated paper	76 cs.
Photo paper	4 cs.
Velvet paper	13 cs.
Parchment paper	9 bls., 22 cs.
Colored paper	4 cs.
Cover paper	5 cs.
Bristol boards	1 cs.
Envelopes	22 cs.
Note paper and envelopes	8 cs.
Writing paper	6 cs.
Miscellaneous paper	62 bls., 62 cs.

CIGARETTE PAPER

Champagne Paper Corp., Schodack, Havre, 268 cs.

Champagne Paper Corp., Lafayette, Havre, 87 cs.

American Tobacco Co., Lafayette, Havre, 325 cs.

Standard Products Corp., Lafayette, Havre, 69 cs.

L. C. Dever, Giulia, Trieste, 3 cs.

WALL PAPER

Globe Shipping Co., New York, Hamburg, 1 bl.

PAPER HANGINGS

W. H. S. Lloyd & Co., Ausconia, Southampton, 4 cs.

NEWS PRINT

Jay Madden Corp., Gen. von Steuben, Bremen, 531 rolls.

Perkins Goodwin & Co., Gen. von Steuben, Bremen, 40 rolls.

Perkins Goodwin & Co., Pr. Harding, Hamburg, 376 rolls.

Perkins Goodwin & Co., New York, Hamburg, 317 rolls.

A. S. Zabriskie, Cliffwood, Hango, 44 rolls.

——, Cliffwood, Hango, 388 rolls.

PRINTING PAPER

Japan Paper Co., Gen. von Steuben, Bremen, 8 cs.

Keuffel & Esser Co., Grete, Hamburg, 16 cs.

S. H. Pomerance, Ausonia, Southampton, 2 cs.

Japan Paper Co., Ausonia, Southampton, 2 cs.

Japan Paper Co., Excambion, Genoa, 1 cs.

IMPRESSION PAPER

Van Oppen Co., Lafayette, Havre, 23 bls.

FILTER PAPER

H. Reeve Angel & Co. Inc., Ausonia, Southampton, 1 cs.

A. Giese & Son, Ausonia, Southampton, 10 cs.

A. Giese & Son, New York, Hamburg, 11 cs.

DRAWING PAPER

Keuffel & Esser Co., Grete, Hamburg, 87 cs., 8 rolls.

M. Grumbacher, Lafayette, Havre, 1 cs.

DECALCOMANIA PAPER

L. A. Consmiller, Bremen, Bremen, 5 cs.

C. W. Sellers, Bremen, Bremen, 14 cs.

C. W. Sellers, New York, Hamburg, 4 cs.

BARYTA COATED PAPER

Globe Shipping Co., Gen. von Steuben, Bremen, 26 crates, 2 cs.

SURFACE COATED PAPER

Gevaert Co. of America, City of Alton, Antwerp, 12 cs.

Globe Shipping Co., New York, Hamburg, 1 cs.

METAL COATED PAPER

Globe Shipping Co., Gen. von Steuben, Bremen, 32 cs.

J. J. Shore, Gen. von Steuben, Bremen, 8 cs.

K. Pauli Co., New York, Hamburg, 36 cs.

PHOTO PAPER

J. J. Gavin, Majestic, Southampton, 4 cs.

VELVET PAPER

K. Pauli Co., Gen. von Steuben, Bremen, 13 cs.

PARCHMENT PAPER

Intl. Acceptance Bank, Gen. von Steuben, Bremen, 5 cs., 9 bls.

Chase National Bank, Gen. von Steuben, Bremen, 17 cs.

COLORED PAPER

P. H. Petry & Co., Gen. von Steuben, Bremen, 4 cs.

COVER PAPER

Intl. Forwarding Co., New York, Hamburg, 5 cs.

BRISTOL BOARDS

Devoe & Reynolds Co., American Trader, London, 1 cs.

ENVELOPES

Japan Paper Co., Gen. von Steuben, Bremen, 1 cs.

J. Beckhard, Bremen, Bremen, 21 cs.

NOTE PAPER AND ENVELOPES

Calhoun Robbins & Co., Majestic, Southampton, 8 cs.

WRITING PAPER

Picciotto, Majestic, Southampton, 2 cs.

H. W. Robinson & Co., Ausonia, Southampton, 1 cs.

Distinctive Writing Paper Co., Lafayette, Havre, 3 cs.

MISCELLANEOUS PAPER

Hensel Bruckman & Lorbacher, Gen. von Steuben, Bremen, 11 cs.

D. F. Young, Gen. von Steuben, Bremen, 14 cs.

——, Bremen, Bremen, 7 cs.

Keller Dorian Paper Co., Majestic, Southmapton, 3 cs.

Japan Paper Co., Lafayette, Havre, 1 cs.

F. J. Emmerich, Lafayette, Havre, 2 bls.

W. Bersch, New York, Hamburg, 1 cs.

Meadows Wye & Co., New York, Hamburg, 7 bls.

Corn Exchange Bank & Trust Co., Tokai Maru, Kobe, 25 cs.

RAGS, BAGGINS, ETC.

T. D. Downing & Co., Cameronia, Glasgow, 48 bls. bagging.

C. Nelson, Cameronia, Glasgow, 20 bls. rags.

Bank of New York & Trust Co., Cameronia, Glasgow, 58 bls. paper stock.

Castle & Overton Inc., Cameronia, Glasgow, 9 bls. paper stock.

Continental Bank & Trust Co., Marengo Antwerp, 103 bls. bagging.

A. H. Searle, Marengo, Antwerp, 167 bls. rags.

E. J. Keller Co. Inc., Marengo, ——, 92 bls. flax waste.

——, Marengo, Aberdeen, 118 bls. rags.

V. Galaup, Schodack, Havre, 50 bls. rags.

Castle & Overton Inc., Schodack, Havre, 98 bls. rags.

The Barrett Co., Ausonia, Southampton, 230 bls. rags.

H. G. Lichtenstein, Lehigh, Leith, 239 bls. rags.

——, Lehigh, Leith, 74 bls. bagging.

——, Pr. Harding, Hamburg, 40 bls. rags.

HIDE GLUE

——, New York, Hamburg, 200 bags hide glue.

——, Giulia, Trieste, 300 bags hide glue.

GLUE

Amderutra, Pr. Harding, Hamburg, 279 bags, 27900 ks.

OLD ROPE

Brown Bros. Harriman & Co., Marengo, Antwerp, 50 bls.

Castle & Overton Inc., Marengo, Hull, 98 bls.

E. J. Keller Co. Inc., Excambion, Genoa, 179 coils.

——, Adriatic, Liverpool, 22 coils.

——, Pr. Harding, Hamburg, 119 coils.

CHINA CLAY

L. A. Salomon & Bro., Adriatic, Liverpool, 250 bags, 70 casks.

J. Lee Smith & Co., Hoxie, ——, 20 casks.

——, Hoxie, ——, 20 casks.

Whitaker Clark & Daniels, Hoxie, ——, 390 bags.

WOOD PULP

——, Gen. von Steuben, Bremen, 150 bls. sulphate; 600 bls. sulphate.

Bulkley Dunton & Co., Gen. von Steuben, ——, 450 bls. wood pulp.

Lagerloef Trading Co., Sagoporack, Kotka, 260 bls. mechanical pulp, 52 tons.

Castle & Overton Inc., Sagaporack, Kotka, 120 bls. sulphite, 25 tons.

——, Sagoporack, Kotka, 728 bls. sulphite, 130 tons; 3134 bls. sulphate, 532 tons.

E. J. Keller Co. Inc., Grete, Hamburg, 324 bls. wood pulp, 50 tons.

Lagerloef Trading Co., Cliffwood, Hango, 520 bls. mechanical pulp, 104 tons.

——, Cliffwood, Hango, 1860 bls. sulphite, 316 tons.

Castle & Overton Inc., New York, Hamburg, 1485 bls. wood pulp, 297 tons.

Gottesman & Co. Inc., Cliffwood, Stockholm, 2700 bls. sulphite, 457 tons.

Gottesman & Co. Inc., Giulia, Sebenico, 4000 bls. wood pulp.

WOOD PULP BOARDS

Lagerloef Trading Co., Cliffwood, Hango, 268 bls., 42 tons.

PHILADELPHIA IMPORTS

WEEK ENDING MARCH 12, 1932

——, Cliffwood, Hango, 13283 bls. sulphite, 2311 tons; 3460 bls. sulphate, 692 tons.

Castle & Overton Inc., Cliffwood, Hango, 1558 bls. sulphite, 301 tons.

Lagerloef Trading Co., Cliffwood, Hango, 730 rolls wood pulp boards, 73 tons; 231 bls. wood pulp boards, 36 tons.

Lancaster News, Cliffwood, Hango, 162 rolls news print.

J. Anderson & Co., Giulia, Trieste, 546 bls. wood pulp.

E. J. Keller Co. Inc., Examelia, ——, 331 bls. rags.

Bulkley Dunton & Co., Kersten Miles, ——, 4050 bls. wood pulp.

CAMDEN IMPORTS

WEEK ENDING MARCH 12, 1932

——, Cliffwood, Hango, 7250 bls. sulphate, 1210 tons.

BALTIMORE IMPORTS

WEEK ENDING MARCH 12, 1932

W. H. Masson, Hoxie, ——, 119 bls. paper stock

——, Maryland, London, 208 bags casein.

Bulkley Dunton & Co., Kersten Miles, ——, 4525 bls. wood pulp.

Bulkley Dunton & Co., Sparreholm, ——, 1675 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING MARCH 12, 1932

——, Maryland, London, 4 cs. coated tissue paper.

NEW ORLEANS IMPORTS

WEEK ENDING MARCH 12, 1932

Canal Bank & Trust Co., Giulia, Trieste, 22 bls. rags.

(Continued on page 50)

WOOD PULP
AGENTS

PRICE & PIERCE, Ltd.,

60 EAST 42nd ST.
NEW YORK

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED
and
MACHINE FINISHED BOOK
and LITHOGRAPHIC
PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, Index Bristol, Post Card and Label Papers

High Grade Coated Book

also

KRAFT WRAPPING AND KRAFT ENVELOPE

Bleached Spruce Sulphite Pulp, Soda and Kraft Pulp

230 Park Ave. New York
35 East Wacker Drive Chicago
503 Market St., San Francisco, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

Glens Falls Machine Works

GLENS FALLS, N. Y.

Manufacturers of

IMPROVED ROGERS AND SPECIAL WET MACHINES

STANDARD WET MACHINES

GLENS FALLS ROLLING ACTION FLAT SCREEN

THE A. D. WOOD SAVEALL, THICKENER, WASHER AND WATER SCREEN

GLENS FALLS DECKER AND DECKER WASHER

GLENS FALLS ROTARY SULPHUR BURNER

PULP GRINDERS, THREE OR FOUR POCKET (Roller Bearings)

Ask us about the
OLIVER-ROGERS WET MACHINE

TI MACHINE SEMI-STEEL
SECTIONAL BURRS

Manufactured in 3, 4, 5, 6 and 7 cuts per inch.

3" Diam.

SHARP — STRONG — TOUGH

ILLUSTRATION SHOWS ½ SIZE

OTHER SPECIALTIES

WARREN IMPROVED CALENDER With flexible blades, Universal Adjustment and Control, Patented — DOCTORS

WARREN IMPROVED DOUBLE DRUM— — WINDER

BALL HYDRANT for Stock Circulating Systems — VALVES

AND OTHER PAPER MILL MACHINERY

MANUFACTURED BY
TICONDEROGA MACHINE WORKS
TICONDEROGA, N. Y.
SEND FOR BULLETINS—ASK FOR PRICES.

Imports of Paper and Paper Stock

(Continued from page 48)

NEW LONDON IMPORTS

WEEK ENDING MARCH 12, 1932

——, Sagoporack, Kotka, 3600 bls. sulphate, 752 tons.

BOSTON IMPORTS

WEEK ENDING MARCH 12, 1932

——, Hoxie, ——, 115 bls. paper stock.
E. Butterworth & Co. Inc., Maryland, London, 65 bls. waste paper.
Brown Bros. Harriman & Co., Maryland, London, 75 bls. waste paper.
1st National Bank of Boston, Maryland, London, 394 bls. waste paper.
G. M. Graves Co., Maryland, London, 111 bls. waste paper; 47 bls. old rope.
Crocker Burbank Co., Maryland, London, 558 bls. waste paper.
Castle & Overton Inc., Sagoporack, Kotka, 2134 bls. sulphite, 426 tons.
——, Sagoporack, Kotka, 1290 bls. sulphate, 236 tons; 2204 bls. sulphite, 370 tons.
Irving Trust Co., Sagoporack, Kotka, 655 bls. sulphate, 109 tons.
——, Sagoporack, Kotka, 274 rolls news print.
Acer & Co. Inc., C. H. Cramp, Port Alice, B. C., 3420 bls. sulphite.
Gottesman & Co. Inc., Giulia, Sebenico, 800 bls. wood pulp.
Bulkley Dunton & Co., Paraguayo, ——, 3000 bls. wood pulp.

PORTLAND IMPORTS

WEEK ENDING MARCH 12, 1932

——, Sagoporack, Kotka, 5833 bls. sulphate, 980 tons; 839 bls. sulphite, 141 tons.
Lagerloef Trading Co., Sagoporack, Kotka, 730 bls. sulphite, 136 tons; 151 rolls news print.
Acer & Co. Inc., C. H. Cramp, Port Alice, B. C., 1520 bls. sulphite.

Indianapolis Demand Backward

INDIANAPOLIS, Ind., March 14, 1932—A cold wave here last week, which shoved temperatures down to record lows for March, was not so beneficial to the paper trade. For one thing it held great quantities of direct by mail advertising that was scheduled for production against the coming of the Easter season. Now the advertisers will wait until the last minute to see more nearly what will happen in weather conditions. They had expected nothing like the weather they were served.

The same conditions did much to halt all negotiations concerning purchase of building papers. Some jobbers stated that they had some live prospects on their lists and when the cold wave hit, they froze too.

The news print demand is low. The local paper trade is expecting some demand the week prior to Easter from the country papers, but the volume used during the present year thus far, is not more than the same period a year ago.

Common paper grades, however, are a little better situated. There is a fair demand for bags and wrapping papers and the prices are firm at the levels set some time ago. Bags particularly seem to be well set.

Little demand is seen now for tissues and it is early for the summer specialty business to open up. However, the trade is expecting a good business on summer specialties this season. The dealers closed out well last fall and have not bought their initial requirements as yet. This, they will have to do shortly. While first purchases are not expected to be large, the coming of hot weather will bring a raft of re-orders. Dealers will keep their stocks well in hand, but they did the same thing last year, and it was a very good year insofar as volume was concerned.

Sutherland Paper Co. Improvements

KALAMAZOO, Mich., March 14, 1932—After having rebuilt the 115 inch and the 132 inch machines for the Sutherland Paper Company here, the Black-Clawson Company is now busily at work rebuilding a third machine. This time it is the 100 inch five cylinder machine at the Standard Division, and following the general Black-Clawson plan this machine is being changed over from a horizontal to a vertical drier type. Many changes will be made and improvements added to speed up and thoroughly modernize the machine. These changes are extensive and the results have shown over 50 per cent increase in the machines' capacities.

In connection with the machine room improvements, the beater capacity will be increased, a contract having been awarded to the Dilts Machine Works, Inc., Fulton, N. Y., for this necessary work and equipment.

The mill is in full operation, working seven days per week, and all these mechanical improvements are being pushed along with the utmost energy. It is expected the work will be completed in time to be put into operation early in April.

The Sutherland Paper Company make a line of high grade patent coated, bleached manila, butter dish stock, etc., enjoys continuous operation and is one mill that has paid its dividends. L. W. Sutherland is president, F. W. Sutherland, secretary, B. F. Dickenson, treasurer, and Walter Crawford, general superintendent.

Saranac Pulp & Paper Co. Resumes

PLATTSBURG, N. Y., March 8, 1932—Operations were resumed this week at the plant of the Saranac Pulp and Paper Company and it is planned to keep between 100 and 150 men and women employed steadily. The mills were purchased recently at an auction sale by the Berst, Forester & Dixfield Company, of New York City, also owners of the Norstrand Manufacturing Company, of this village. Preparations to resume operations have been under way for some time and the mills have been completely overhauled.

Container Corp.'s Report

The Container Corporation of America has reported a net loss of $686,812 for 1931 after all charges, as compared with a net loss of $482,990 in the previous year. The financial position of the company at the close of 1931 showed an improvement over the previous year. Current assets were $3,641,373 including cash of $876,050. against current liabilities of $713,401. Cash was increased during the year, while receivables, inventories and payables were reduced. President Walter P. Paepcke said that tonnage shipped last year was only 2.2 per cent below 1930 but that prices were substantially lower.

Swedish Paper Mill Strike Looms

WASHINGTON, D. C., March 16, 1932—Efforts of the mediation commission in Sweden to settle amicably the dispute between the paper mills and their operatives is reported to have ended in failure, according to a report to the Department of Commerce from Trade Commissioner Dahl at Stockholm. The employers have now decided to reduce time and piece work wages 8 per cent, effective March 21, a step which will probably be followed by a strike on the part of the workers.

Sulphur

A FIRST REQUISITE

in

Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Gulf, Newgulf and Long Point, Texas

SPEED

AND SURE PERFORMANCE in cutting
RAGS, BURLAP, BAGGING, ROPE

TAYLOR, STILES & COMPANY GIANT REG. U.S. PAT. OFF. RIEGELSVILLE, N.J. U.S.A.

if your plant is equipped with RAG CUTTERS

the standard of the world for 60 years

This is the Giant Cutter No. 2-A with a capacity of 3000 lbs. per hour. A strong, heavy machine designed for cutting thread waste, jute butts, burlap, gunny bagging, magazines, catalogs, old papers and all grades of rags.

GIANT RAG CUTTERS HAVE CAPACITIES RANGING FROM 1 ton to 5 tons per hour.

TAYLOR, STILES & COMPANY
Riegelsville, N. J.
CANADIAN REPRESENTATIVES
Waterous Limited, Brantford, Ont., Canada
SOLE AGENTS FOR EUROPE
R. J. Marx, 133-39 Finsbury Pavement, London, E. C.

QUALITY PULPS

HAFSLUND NORWAY — "HAFSLUND BEAR" Bleached Sulphite

F:HAGA — "FORSHAGA" Bleached Sulphite

KRAFT HURUM NORWAY SPECIAL — "HURUM SPECIAL" Extra Strong Kraft

KOOS BAC — "BAMBLE" Extra Strong Kraft

Fresh Monthly Shipments—No Closed Winter Season

The Borregaard Company
Incorporated
200 FIFTH AVENUE NEW YORK, N. Y.

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

DRAPER BROS. COMPANY
CANTON, MASS.
Woolen manufacturers since 1856

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, March 16, 1932.

Trading in the local paper market was only moderately active during the past week. Inquiries for the various standard grades of paper are fairly numerous, however, some of which should materialize into good business. Sales forces of the leading paper organizations are conducting a strenuous campaign and are more optimistic than of late.

The news print market continues quiet. The volume of advertising in the leading newspapers for February was 12 per cent below the record of the corresponding period in the preceding year. Periodical advertising fell off 25 per cent in the same period. Production of news print paper is being maintained in sufficient volume to take care of current requirements.

Some improvement was noticed in the paper board market. Demand for box board is gradually expanding, and prices are fairly steady. The fine paper market is also more buoyant. Tissues are moving in good volume. Supplies of kraft wrapping paper are going forward at a satisfactory pace, and efforts to stabilize the industry are continuing.

Mechanical Pulp

No radical changes were reported in the ground wood market. Demand for both domestic and imported mechanical pulp is about normal for the season. Offerings are not excessive, as production has been practically keyed to consumption. Inquiries for future needs are fairly numerous. Prices are holding to schedule, in most instances.

Chemical Pulp

Affected somewhat by the pulp mill workers strike in Sweden, the local chemical pulp market is slightly firmer. The closed mills have an annual productive capacity of 648,000 tons. Imported bleached sulphite is now quoted at from $2.10 to $2.90, on dock, Atlantic ports; while domestic bleached sulphite is offered at from $2.00 to $3.75, f.o.b. pulp mill.

Old Rope and Bagging

Paper mill demand for old rope is fairly active. More interest is being displayed in both domestic and imported old manila rope than of late. Small mixed rope is moving slowly. Prices remain unaltered. The bagging market is fairly steady. Roofing bagging is in seasonal request; while scrap and gunny are going forward in moderate volume.

Rags

The position of the domestic rag market is practically unchanged. Demand for cotton rags is mostly limited to a few grades in limited supply. Roofing stock is in better request, and, with offerings somewhat scarce, prices are firmer. The imported rag market continues listless, and is still affected by the fluctuations of foreign currency.

Waste Paper

More than one hundred mixed paper packers in the metropolitan area are now reported to be taking part in the production strike, and the movement seems to be growing. The local packers are endeavoring to force the quotations on this grade to where they can cover their costs in collecting, sorting and packing.

Twine

During the past week, most of the business transacted in the local twine market was along routine lines. Demand for the various grades has been fairly persistent, the approach of Easter assisting materially. Prices are generally holding to previously quoted levels, although competition for desirable orders is keen.

AUTOMATIC PAPER MAKING

(Continued from page 46)

units which are generated by mechanical action of beaters, jordans and pumps by "direct" recirculation of white water, uniform and greater water removal at presses due to heat contained in stock and freeness of hot stock, should result in considerable power saving. The heat should have the effect of pre-drying. Among other advantages are elimination of spills, culled paper, necessity of notifying the beaterman when starting or stopping machine, automatic adjustment of stock when changing speed of machine or basis weight, elimination of guess work, minimizing if not entirely eliminating slime due to keeping water in constant solution with stock, increased per ton felt life in many cases, increased production capacity and better standards for figuring costs.

No white water should leave the system unless the raw stock contains a greater percentage of moisture than that which is contained in the sheet being delivered to the driers.

Norwegian Pulp Market Listless

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., March 16, 1932—In the Norwegian market the pulp turnover continues at an unsatisfactory volume according to Acting Commercial Attache MacLean, at Oslo. The report states that prices have not undergone any downward revision, but are weak. The wrapping paper mills are reported to be now feeling the effects of the British duty. The printing paper market is in a somewhat better shape, inasmuch as most of the news print mills are operating full capacity and the demand for thin printings continues active. Statements of operations of a number of the pulp mills for 1931 are reported to show losses, and it is suggested that some may find it most advantageous to liquidate.

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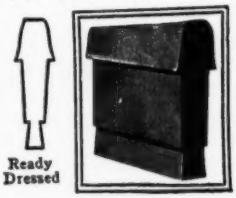

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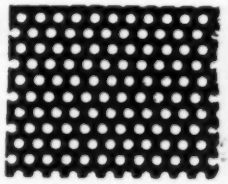

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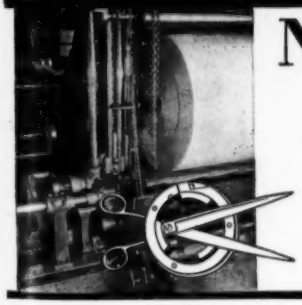

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Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, March 16, 1932.

BLANC FIXE.—The blanc fixe market is in a fairly satisfactory position. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton; while the powder is selling at from 3¼ cents to 3⅜ cents per pound, in barrels, at works.

BLEACHING POWDER.—Demand for bleaching powder is fairly persistent. The contract movement is seasonal. Prices are generally holding to previously quoted levels. Bleaching powder is offered at from $1.75 to $2 per 100 pounds, in drums, at works.

CASEIN.—The casein market continues quiet. Domestic standard ground is quoted at 7 cents and finely ground at 7½ cents per pound. Argentine standard ground is selling at 8¼ cents and finely ground at 9½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Some improvement was noticed in the caustic soda market. Prices remain unchanged. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is moderately active. Contract shipments are moving with regularity. Imported china clay is still quoted at from $11 to $13 per ton; while domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. The contract movement is well up to average. Prices are holding to schedule without difficulty. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market continues to display a strong undertone. Grades of gum rosin used in the paper mills are quoted at from $4 to $4.30 per 280 pounds, in barrels, at works. Wood rosin is selling at $3.85 per 280 pounds, in barrels, on dock.

SALT CAKE.—No radical changes were reported in the salt cake market. Prices are fairly steady. Salt cake is quoted at from $15 to $16; chrome salt cake at from $12 to $13 per ton, in bulk, at works. Imported salt cake is selling at from $14 to $15 per ton, ship side.

SODA ASH.—Supplies of soda ash are going forward in fairly good volume for the time of year. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1; in bags, $1.25; and in barrels, $1.38.

STARCH.—The position of the starch market is practically unchanged. Shipments against contract are moving at a steady pace. Special paper making starch is still quoted at $2.54, in bags; and at $2.81 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Paper mill demand for sulphate of alumina is well maintained. Prices are holding to schedule. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is fairly active. Sulphur is quoted at 18 per long ton, on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and nearby car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market of late has been along routine lines. Prices remain unchanged. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at mine. Imported talc is still offered at from $18 to $22 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@38.00
Bonds	5.00	@53.25
Index	6.00	@12.00
Writings—		
Extra Superfine	6.50	@15.00
Superfine	6.25	@14.75
Tub sized	4.50	@ 7.00
Engine sized	3.00	@ 5.00
Book, Cased—		
S. & S. C.	5.25	@ —
M. F.	3.75	@ 5.00
Coated and Enamel	6.25	@ 9.75
Lithograph	6.75	@11.25
Tissues—Per Ream—		
White No. 1	.65	@ .70
Anti-Tarnish M. G. only	.65	@ .70
Colored	.70	@ .90
White No. 2	.50	@ .60
Kraft	.65	@ .70
Manila	.55	@ .60
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.00	@ 5.25
No. 2 Wood	3.50	@ 4.00
Butchers	3.37½	@ —
Fibre Papers—		
No. 1 Fibre	4.25	@ 5.50
No. 2 Fibre	4.00	@ 4.75
Common Bogus	1.50	@ 3.00
Screenings	2.00	@ 3.00
Card Middies	4.00	@ 5.00
Glassine—		
Bleached, basis 25 lbs., No. 1	.09¼	@ —
No. 2	.11¼	@ —
Bleached, basis 20 lbs.	.11¼	@ —

(Delivered New York)

News, per ton—		
Roll, contract	53.00	@ —
Rolls, spot	53.00	@ —
Sheets	58.00	@ —
Side Runs	38.00	@42.00
Kraft—		
No. 1 Domestic	4.75	@ 6.00
No. 2 Domestic	3.25	@ 4.00
Southern	3.25	@ 4.00
Imported	3.50	@ 4.30
Boards—per ton—		
News	24.00	@27.50
Straw	34.50	@45.00
Chip	24.00	@27.50
Binders' Boards	62.00	@70.00
Standard 85 Test Liner	32.50	@37.50
Sgl. Mla. Ll. Chip	32.50	@37.50

(F. o. b. Mill)

Wood Pulp Boards	70.00	@80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	22.00	@24.00
Dry	22.00	@24.00

(F. o. b. Mill)

No. 1 Domestic	20.00	@28.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	2.10	@ 2.90
Easy Bleaching	1.60	@ 1.75
No. 1 strong unbleached	1.50	@ 1.75
Mitscherlich unbleached	1.55	@ 1.75
No. 2 strong unbleached	1.40	@ 1.50
No. 1 Kraft	1.50	@ 1.75
No. 2 Kraft	1.40	@ 1.50
Sulphate—		
Bleached	1.85	@ 2.15

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	2.00	@ 3.75
Easy Bleaching	1.75	@ 1.90
News	1.50	@ 1.65
Mitscherlich	2.40	@ 2.55
Kraft (Domestic)	1.60	@ 2.75

(Delivered Paper Mills)

Soda Bleached	2.50	@ —

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	4.50	@ 5.00
New White, No. 2	3.50	@ 4.00
Silesias No. 1	3.50	@ 4.00
New Unbleached	6.00	@ 6.50
New Blue Prints	3.25	@ 3.50
New Soft Blacks	2.50	@ 3.00
Blue Overall	3.50	@ 4.00
Fancy	2.50	@ 3.00
Washables	1.75	@ 2.00
Mixed Khaki Cuttings	3.00	@ 3.25
Pink Corset Cuttings	Nominal	
O. D. Khaki Cuttings	3.50	@ 3.75
Men's Corduroy	1.50	@ 2.00
New Mixed Blacks	2.00	@ 2.25

Old Rags

White, No. 1—		
Repacked	5.25	@ 5.75
Miscellaneous	4.25	@ 4.75
White, No. 2—		
Repacked	3.00	@ 3.50
Miscellaneous	2.30	@ 2.50
St. Soiled, White	1.50	@ 1.75
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.65	@ 1.85
Black Stockings	3.25	@ 3.75
Roofing Rags—		
No. 1	.53	@ .58
No. 2	.48	@ .53
No. 3	.43	@ .48
No. 4	.38	@ .43
No. 5A	.33	@ .38

Foreign Rags

New Rags

New Dark Cuttings	1.40	@ 1.50
New Mixed Cuttings	1.60	@ 1.75
New Light Silesias	3.40	@ 3.50
Light Flannelettes	3.75	@ 4.00
Unbleached Cuttings	5.50	@ 6.00
New White Cuttings	4.75	@ 5.00
New Light Oxfords	4.00	@ 4.25
New Light Prints	2.00	@ 2.25

Old Rags

No. 1 White Linens	5.25	@ 5.50
No. 2 White Linens	4.50	@ 4.75
No. 3 White Linens	3.25	@ 3.75
No. 4 White Linens	1.75	@ 2.25
No. 1 White Cotton	4.00	@ 4.25
No. 2 White Cotton	3.00	@ 3.25
No. 3 White Cotton	2.25	@ 2.50
No. 4 White Cotton	1.40	@ 1.50
Extra Light Prints	1.90	@ 2.10
Ord. Light Prints	1.60	@ 1.75
Med. Light Prints	1.40	@ 1.55
Dutch Blue Cottons	1.35	@ 1.40
French Blue Linens	2.00	@ 2.25
German Blue Linens	2.00	@ 2.10
German Blue Cottons	1.20	@ 1.25
Checks and Blues	1.25	@ 1.30
Lindsay Garments	.75	@ .80
Dark Cottons	.70	@ .75
Old Shopperies	.55	@ .60
New Shopperies	.60	@ .65
French Blues	1.25	@ 1.30

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.10	@ 1.20
Domestic	1.15	@ 1.25
Wool Tares, light	1.00	@ 1.05
Wool Tares, heavy	1.00	@ 1.10
Bright Bagging	1.00	@ 1.05
Small Mixed Rope	.90	@ 1.00
Manila Rope—		
Foreign	1.50	@ 1.60
Domestic	1.50	@ 1.75
New Burlap Cut	1.70	@ 1.80
Hessian Jute Threads—		
Foreign	2.60	@ 2.75
Domestic	2.80	@ 3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	2.55	@ 2.75
Hard, white, No. 2	1.90	@ 2.00
White envelope cuttings	2.05	@ 2.15
Soft, white, No. 1	1.70	@ 1.80
Flat Stock—		
Stitchless	.70	@ .80
Overissue Mag	.70	@ .80
Solid Flat Book	.60	@ .70
Crumped No. 1	.45	@ .50
Solid Book Ledger	1.75	@ 1.85
Ledger Stock	.60	@ .70
New B. B. Chips	.20	@ .30
Manilas—		
New Env. Cut	1.75	@ 1.85
New Cuttings	1.40	@ 1.50
Extra No. 1 old	1.05	@ 1.15
Print	.45	@ .50
Bogus Wrapper	.45	@ .50
Container	.25	@ .30
Old Kraft Machine—		
Compressed bales	1.00	@ 1.10
News—		
No. 1 White News	1.60	@ 1.65
Strictly Overissue	.35	@ .45
Strictly Folded	.25	@ .30
No. 1 Mixed Paper	.15	@ .20
Common Paper	Nominal	

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ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

SIXTIETH YEAR

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